AMIGA PRODUCT GUIDE: Software Tools Edition

Amazing COMPUTING™

Your Original AMIGA™ Monthly Resource
Vol. 3 No. 6 June 1988
US $3.95 Canada $4.95

AMIGA Programming: Capitol Gains

1988 AMIGA DEVELOPERS CONFERENCE IN WASHINGTON

- New Products Previewed
- Session Highlights
- Amiga Working Groups Proposal
  by Perry Kivolowitz & Eric Lavitsky

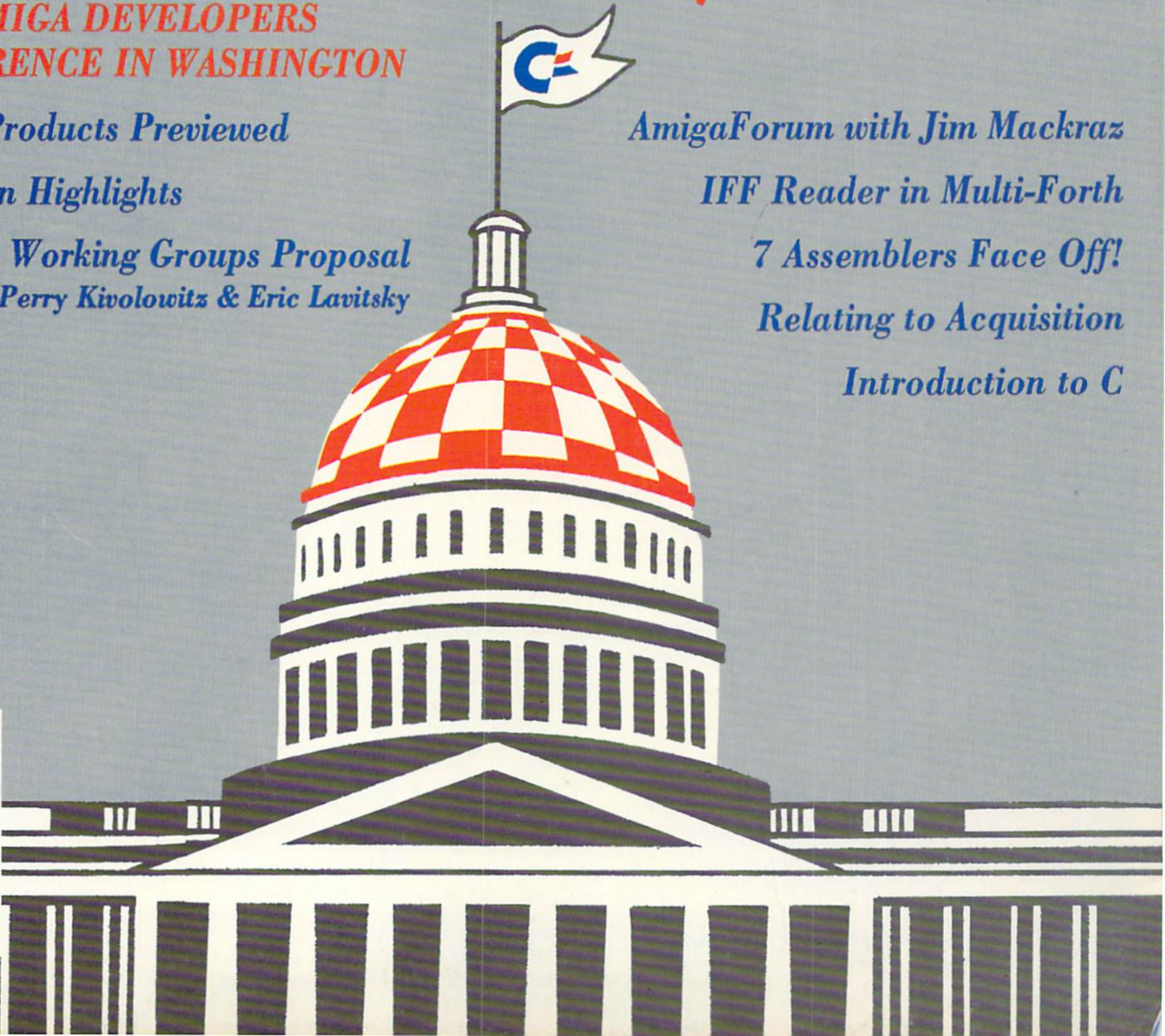
AmigaForum with Jim Mackraz

IFF Reader in Multi-Forth

7 Assemblers Face Off!

Relating to Acquisition

Introduction to C



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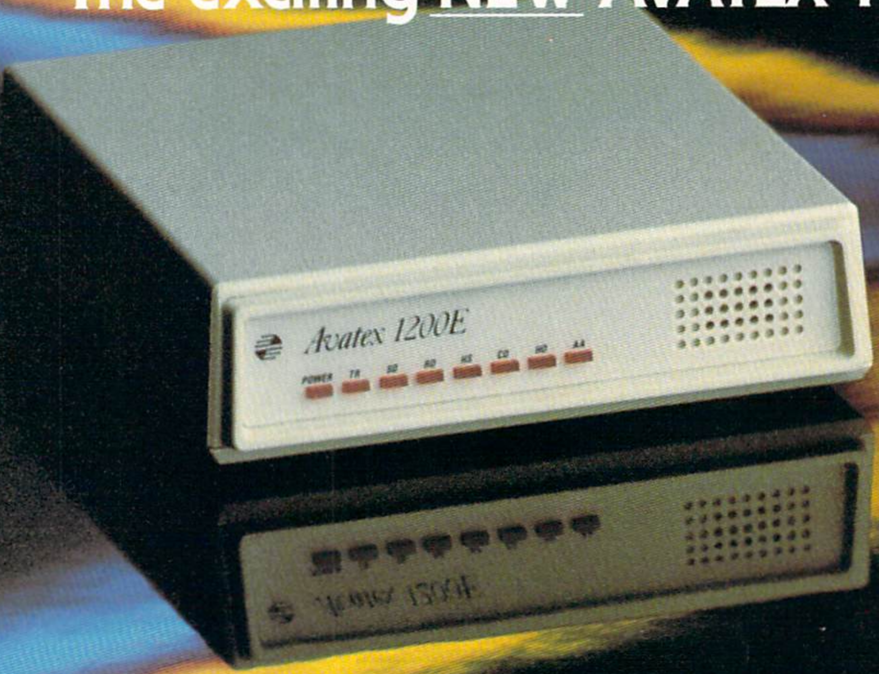

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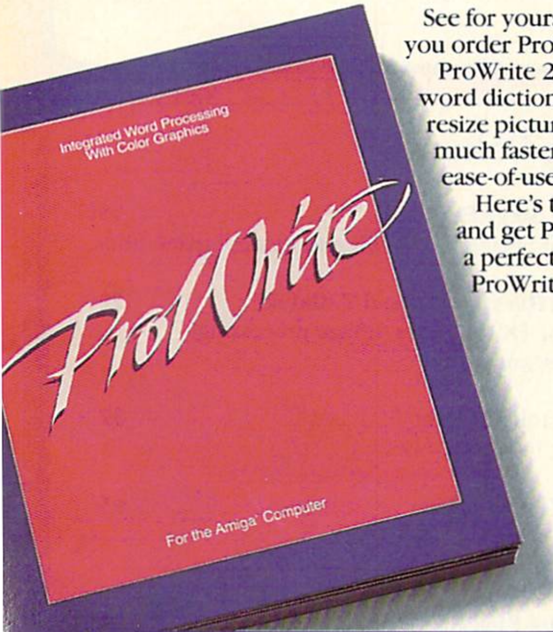

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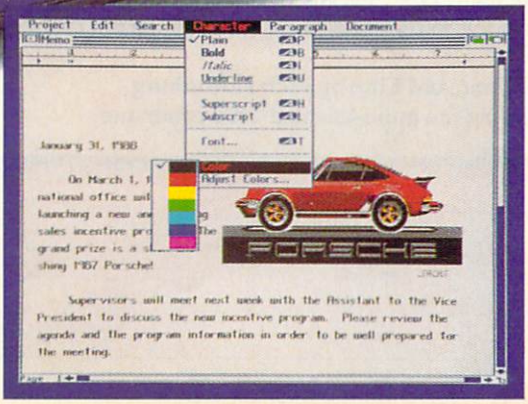

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Volume 3, Number 6

CONTENTS

Amazing Features

Reassigning Workbench Disks by John Kennan 51
Endless disk swapping comes to a merciful end.

Product Guide: Software Tools Edition 55
A listing of all the products you need to put your Amiga to work.

An IFF Reader in Multi-Forth by Warren Block 75
Create an easy to use IFF reader in Multi-Forth.

Basic Directory Service Program by Bryan Catley 81
A file manipulation program in AmigaBASIC™

Don't Give Me ZeroZero, or Clip Your Own by Mark Cashman 87
A programming alternative to the GimmeZeroZero windows.

C Notes from the C Group by Stephen Kemp 98
A beginner's guide to the power of C programming.

An Amiga Forum Conference with Jim Mackraz 101
The Amiga market as seen through the eyes of the "Stepfather of Intuition."

The 1988 Commodore Amiga Developers Conference 112
A look inside the conferences held and new products announced in Washington, D.C.

Amiga Working Groups by Perry Kivolowitz and Eric Lavitsky 115
An outline of the innovative Amiga Working Groups concept.

Amazing Reviews

Bear Time by Steve Carter 13
What makes this inexpensive A1000 battery-backed clock tick?

Acquisition by David N. Blank 25
A look inside the latest release of a powerful relational database.

Butcher 2.0 by Gerald Hull 33
A tidy collection of diverse image processing utilities.

Son of Seven Assemblers by Gerald Hull 105
A comparative battle between seven native-code assemblers.

Amazing Departments

From the Editor 4

Amazing Mail 6

Reader Service Card/Index of Advertisers 128

Amazing Columns

Take-Five! by Steve Hull 15
An pre-peek at Spring COMDEX and five hot game titles.

Hot on the Shelves by Michael T. Cabral 22
New products: DOS utilities, image processing, galactic battles, and more!

Bug Bytes by John Steiner 37
Bugs check in, but...

Roomers by The Bandito 95
A3000 hoax . . . celebs at FAUG . . .
Microsoft comes to the Amiga?

AmigaNotes by Rick Rae 39
Amiga audio products move towards the top of the scale.

The Command Line by Rich Falconburg 46
Exploring the multi-talented LIST command.

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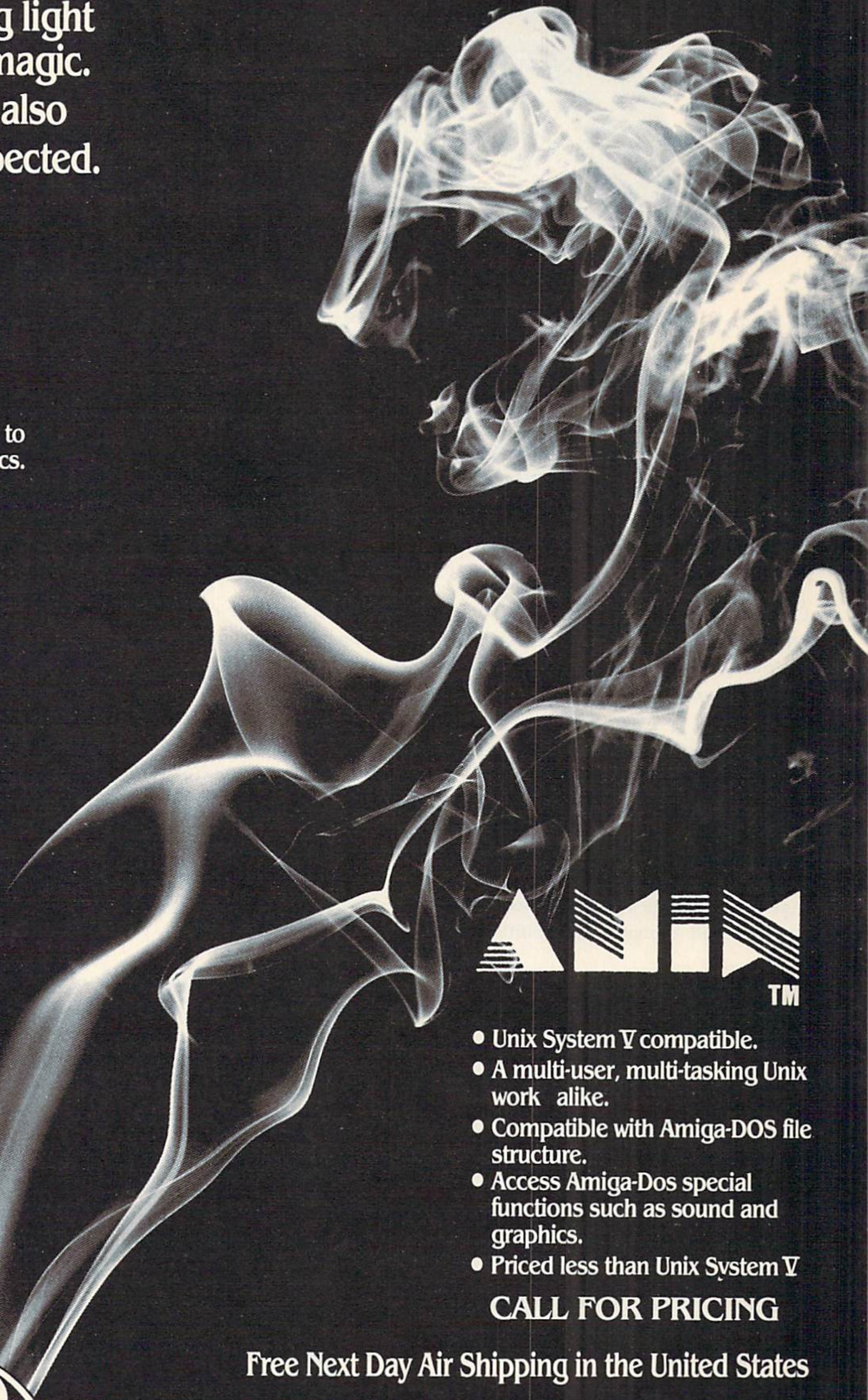

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West Chester, PA, May 9, 1988 — Commodore Business Machines, Inc. recently announced that it has shipped **over 600,000 Amiga personal computers worldwide.**

The Amiga development community has written over 1100 software programs for the Amiga 2000 and 500, ranging from WordPerfect's Amiga version of its popular word processing package, to programs that take advantage of the Amiga's sound, video, graphics and animation capabilities.

According to Max E. Toy, president and chief operating officer for Commodore Business Machines Inc., "The Amiga's success is due both to the wide variety of sophisticated software support it has received and to the Amiga's advanced operating system. The Amiga offers true multi-tasking capabilities which allows users to do several computing tasks simultaneously. For example, while writing a lengthy report, a user can concurrently print the document, open a separate window to create a bar chart and run non-related software tasks as an integrated function."

"We see the Amiga becoming a standard business computer as well as the graphics system for corporate communications departments, television studios and video production houses," Toy continued. "Because we designed the Amiga to be completely expandable, an Amiga purchased in 1988 will continue to meet the personal computing needs of users well into the 1990's."

This edited notice documents the Amiga's rise to the class of prominent computers. The figure is even more impressive when compared to the 200,000 installed base Commodore announced last summer, representing a growth of 200% over the last 10 months.

The only notable omission here is recognition of Amiga users. The advanced software and hardware now available for the Amiga are tied directly to the Amiga users' enthusiasm, support, and continuous demand for better products. Now, as we see the promise of a truly superior multi-tasking environment, I believe Amiga users deserve a lion's share of the credit.

This upbeat news in no way means we should drop our guard. Every facet of this machine has incredible potential waiting to be tapped. From video to sound, from multi-tasking to machine architecture, the Amiga is still as new and exciting as it was nearly three years ago.

Sincerely,
Don Hicks
Managing Editor

Amazing COMPUTING

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AMAZING MAIL

Dear AC,

I believe that you already have our group on your users group list, but we have recently changed our mailing address. I thought that you would be interested in the information. Our information is:

A Bakersfield Area Commodore Users Society (ABACUS)
P.O. Box 40334
Bakersfield, CA 93384
BBS Phone Number (805) 832-7186

Yours in computing,
Jim Brammer
Membership Committee

Dear AC,

We would appreciate it very much if you would publish our bulletin in the next issue of your magazine.

Thank you
Roland Snyder II
(Co-Chairman)

1988 Commodore Computerfest

The third annual Chicagoland Commodore Computerfest will be held August 28 at the Exposition Center at the Kane County Fairgrounds, St Charles, IL.

The show, presented by the Fox Valley 64 User Group, will feature national speakers, venders, and products for the 64, 128, and the Amiga. It is the largest Commodore computer club show in the Midwest.

Admission fee is $5.00 for the day and includes access to all the speaker and tech sessions. For more information write to,

Computerfest
P.O. Box 28
North Aurora, IL 60542

Dear Amazing Computing,

Please change the address of our users group in your data base to the above. The current club officers are:

President/Secretary/Librarian
- Jack L. DeKemper
Vice President - Mike Roper
Treasurer - Martin Magnus

We have an Amiga bulletin board operating from 10 pm-5 am, 7 days a week. Its number is 1-803-552-7227. We request that you announce this item in your magazine.

Sincerely,
Jack L. DeKemper
President,
Amiga Charleston Users Group
P.O. Box Charelston, SC 29411-0543

A special note to all user groups! *Please send us your name, meeting address, meeting times, officers, contact people, BBS information, and telephone (if available). AC has always supported and encouraged the development of good user groups and the best way to increase the activity of yours is to let your fellow Amiga users know where to reach you. If you do not wish all of the enclosed information published, please let us know.*

Please send your input to:
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Greetings Amazing Computing!

Thank you for including the informative "Macrobatics" feature written by Patrick J. Horgan (AC Volume 3 Number 4). The subsection "Writing Stand Alone Programs with the Aztec Assembler" has freed me from the comparatively slow Amiga Macro Assembler (v1.1). I would like to, however, point out other fundamental differences between the two. Perhaps this will benefit other readers.

In the Aztec reference manual (mine is for the V3.4a Developer System) I have found no reference to the "*" current program counter symbol. The assembler will accept the symbol but will not produce code accordingly. Use labels instead to overcome this difference.

Also, the Amiga Macro Assembler will assemble files where code and data sections are not separated by SECTION directives without causing an error. The Aztec assembler will attempt to assemble DC and DS directives as code if the sections are not separated by the proper SECTION, DSEG, or CSEG directive, thus causing an error for each.

Another difference, and a major advantage over the Macro Assembler, is the fact that the Aztec link libraries also contain C functions (such as printf) which can be used by pushing arguments onto the stack (in reverse order) instead of loading them into registers.

Please keep the "technical" features coming. They are much appreciated.

Sincerely,
Michael McFarland
California

AC will continue its tradition of providing well rounded and informative articles for our readers. How "technical" these articles are is directionaly proportional to the amount of good technical articles submitted.

Thank you for your notes.

Dear Amazing Computing,

As an avid reader and subscriber I have immensely enjoyed your excellent magazine. Please continue your support of Public Domain and print more programs and articles on AmigaBASIC. That said, I have a few questions...

Is it true that the Amiga 1000 has been discontinued?

I understand that the only major difference between the 1000 and the

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2000 is that the 2000 has more and better expansion ports. Is there a device available or under development that will give the 1000 those same ports? Is it possible at all? If not, what is the closest thing to it? If the machines are internally the same, it seems plausible. I would like to be able to use A2000 hardware on my 1000, specifically a hard drive and the Bridgecard.

Why can't Kickstart and Workbench be on the same disk? Kickstart is only 256K, and if you cut away some excess on Workbench, they should fit. That way, you could boot with just one disk. I know WB is a DOS disk, and Kickstart is not, but I don't understand why Commodore designed the system to be booted with two disks when they'll fit on one. Also, under AmigaDOS 1.3 you may boot from a hard disk; does that mean you can put Workbench and Kickstart on it?

Why do A1000 peripherals cost more than those for the A2000? For example, an A2000 20MB hard disk is as low as $319, but the lowest one I've seen for the 1000 is about $800. I realize A2000 drives are internal, but drive cases can't be that much more expensive!

I've seen a lot of ads for "unpopulated" RAM boards, but never an ad for the RAM chips, how much are they, and how easily are they installed?

A thousand thanks for the answer to these questions.

Sincerely,
Howard Fincher
Florida

Whew!

I hope AC can answer all of your questions. In sequence:

Yes, the Amiga 1000 is no longer in production. However, these machines represent a very large percentage of Amiga users and everything is being done by Amiga software developers to stay compatible with the Amiga 1000.

Expansion devices for the Amiga 1000 are available from ASDG and Byte by Byte. However, these expansions are not designed for Amiga 2000 cards and not all cards will work with them. From the original design and implementation of the Amiga 2000, it is not possible to use cards designed for the special chip access and slot designs of the Amiga 2000 in any expansion device for the Amiga 1000.

Kickstart and Workbench do reside on the same disk if you use Amigo Business Systems Kickwork 1.3 as reviewed in AC V2.9. There are additional programs available in the public domain.

Amiga 2000 peripherals are not always cheaper. However, the Amiga 2000 has taken advantage of the more popular IBM style peripherals and these are more plentifull and less expensive.

RAM chips are extremely expensive at the moment and very few dealers or developers are confident to publish prices based on the unpredictable pricing now available. Most of these developers will either quote you a price at the time of your order or they will suggest an alternative source.

Good Luck, and keep the questions coming.

Dear AC,

Thank you very much for your reminder on my subscription renewal. I did not know that I was due because your system is very confusing. The magazine has a Volume and Number on it and the label on the envelope says 5 88. Thanks again and keep up the good work on the best Amiga mag on the market.

Cordially,
Stephen Marhoffer, New Jersey

Our system is not really a mystery. The Volume Number represents the year in production. Thus Volume 3 stands for 1988. The remaining number is the number of the month. Thus V3.6 means June (month 6) of 1988.

However, due to the US Postal System requirements for 2nd class subscription mailings, all of our future issues will have the month printed on the cover. This does have one small drawback. AC publishes the June issue to be sold and to be read in June, now AC will be sitting on the stands with a June date beside other publisher's products with August and July covers.

A Virus Residing in your RAM
Dear Amazing Computing:

Yes, even us Green Berets here in Southern Germany have time to use our Amigas, so far from home! Anyway, here is my tip. Thanks for your great magazine!!

Just when you thought it was safe... Virus II. There are several strains of Virus II. There are several strains of virus that will remain resident in your Amiga 500's even after a complete shutdown! This will occur if you own a RAM expansion i.e. 501 RAM Expansion with a real time clock. The new strain of virus remains resident in your RAM expansion after any and all shutdowns, with the assistance of the battery (which happens to keep your built in clock running). Solution: remove the RAM expansion, open the casing (which may require some soldering), remove the battery, the virus will then be removed from the RAM, replace the battery. It's best for owners to check newly aquired disks with one of the many virus checkers available.

Sincerely,
Gill Shatto
Germany

This is the first we have heard of a RAM resident virus hiding in a battery supported Ram card. In a recent report from Commodore to its American Developers (see the article concerning the Washington Amiga Developer's conference at the end of this issue), it was claimed that the best

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cure for any virus was a cold boot from a sterile disk. If this current "strain" is active, that preventative treatment will be useless.

Please keep us informed!

Dear Amazing Computing:

I have noted some of the complaints from users regarding the speed of the 64 Emulator by Readysoft. Now its true that there is a noticeable speed loss, but if you program in Basic, there is a way to speed up those programs. As long as they are pure Basic programs (no ML subroutines), just compile them with the Basic-64 compiler available from Abacus Software. Then, when run on the Amiga via the 64 Emulator; Voila! The programs run as fast, if not faster, than the standard version on a C-64.

The combination of the Readysoft Emulator and Abacus Compiler makes for a winning combination. Perhaps Abacus will release their compiler on 3.5 disks for Amiga users who dabble in the world of the C-64. Try it! I guarantee you will be pleasantly surprised!

Yours very truly,
David A. Bush
Canada

It seems you followed the old adage, "If it is broken, program it!"

Dear Amazing Computing:

This is the second time I have had the need to write you. First time was for added memory and you published the article "A MegaByte without MegaBucks" by Chris Erving which I did and it worked fine.

Since this time I have purchased A.S.D.G. MiniRack at the AmiExpo in New York with two megs of RAM after hounding Perry Kivolowitz for this item until he finally gave in and sold his model at the show.

January of this year I decided to buy a hard drive system so I went out and purchased a C-Ltd 33 meg drive, after a slight problem with SCSI Host/Controller and a couple of month's passing by I finally had a complete system, I felt. This was short lived as my A.S.D.G. board would not work plugged into the controller, two female boards, so off to the local Tech School and I had a straight pass through double 86 pin male board for the job. Home and happy it would not work either.

I phoned Perry Kivolwitz, and he told me to read Amazing Computing's article on PAL help so I read the mod, got the wire as needed and presto, plug the system all together and you're right, all problems cured, memory and hard drive now working properly.

So far, two of my most difficult problems have been answered by your magazine and the articles you publish, keep up the good work and I would like to thank Perry Kivolowitz for the MiniRack and Pal help article page 58, Vol 3 Number 3, and your magazine for the proper drawing to do this which was in a later issue.

Thank you,
Tom Price
Canada

Dear Amazing Computing:

You would do your readers a real service if you advertised that you accepted advertisements only from those organizations that did not bill customers credit cards prior to actual shipment of merchandise. Last spring I was burned by an AC advertiser relatively new to Commodore products. It was determined (after credit card billing shock) that merchandise was advertised which was not in stock and would not be in stock until a sufficient number of orders were placed. Over $1500 of mine was tied up for four months. The advertiser was found to be billing customers upon receipt of their telephone orders and using the "no interest loans" until sufficient funds were on hand to place quantity orders with the manufacturer. Recently, another advertiser with whom I traded for several years instituted this despicable practice of charging customers credit cards on receipt of order and without merchandise being in stock to ship. In neither case did the advertiser advise me of their unscrupulous practice when their telephone order was placed.

Sincerely,
M.N. Yoder
Virginia

To the best of my knowledge, it is illegal to charge for a product on a credit card before it is shipped. Besides, the credit laws are so secure in most states that the customer retains the right to refuse payment and thus have any erroneous charges removed from the account.

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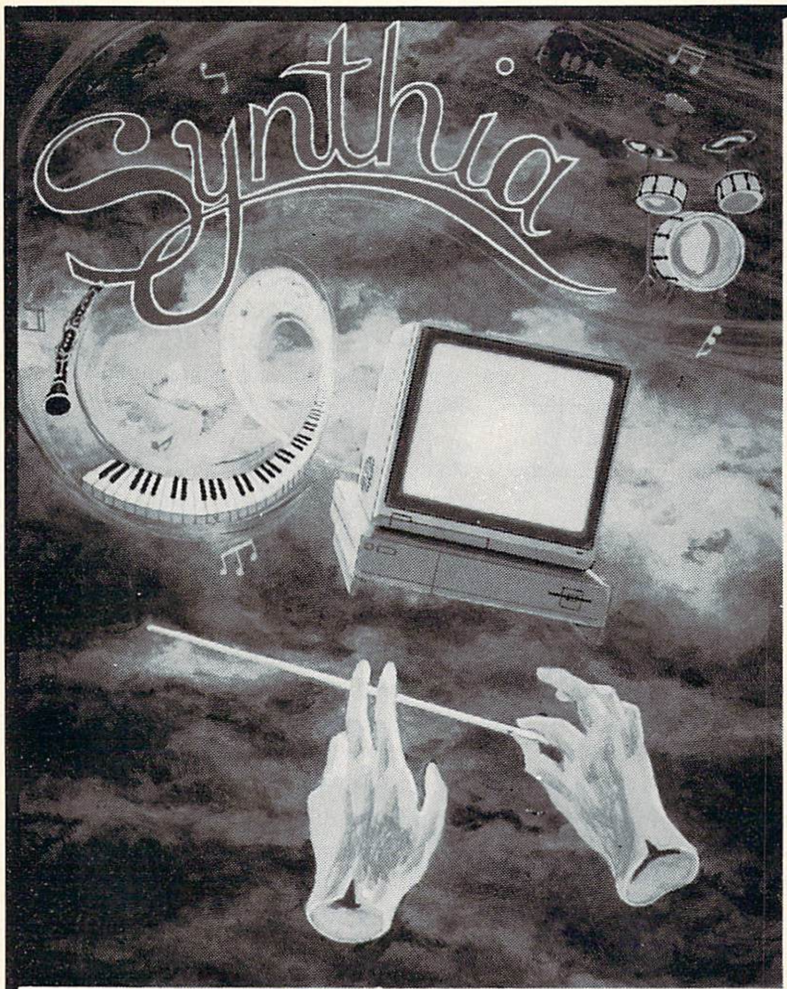

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Dear Amazing Computing:

I am another Amiga 1000 owner who wants to upgrade my computer with the Fat Agnus Chip.

I read R. Wainwright's letter in issue v3.4. In his letter he asked if someone could come up with a Fat Agnus Hardware hack that would make it possible to install the new Fat Agnus chip and the extra 512k of chip memory has already been solved.

I installed a hack by Chris Erving, about a year ago, that adds 512k of memory to the Amiga system. This little hack had one small problem, under Workbench 1.2 the Amiga autoconfigured the extra memory as chip memory. Since the original Agnus chip did not recognize 1 meg of memory it caused the system to fail to work properly, so a small modification was added so the new memory could be accessed as fat ram. Now that the new Fat Agnus chip recognizes 1 meg of chip ram, I believe Chris Erving's hack, without the modification, should work.

I hope the solution for the extra chip ram is this simple, if so, half the battle in getting Fat Agnus chips to work in Amiga 1000s would be over.

Sincerely,
Jeff Robel
Texas

I hope the publication of this letter will produce some reaction. The effort to make the A1000 Fat Agnus compatible may become a non-issue as the new "fatter Agnus" is released.

Dear Amazing Computing:

USING THE ECHO COMMAND

Here is a hint to speed up Amiga DOS. When using the ECHO to print more than one line of text, there is no need to use a separate ECHO for each line.

Thanks for the ECHO's wordwrap feature, you can just combine all your lines of text. This hint will definitely qualify as a "startup-sequence" speeder-upper.

Hope you can use this helpful hint.

Yours truly,
Dennis Spranger
Wisconsin

Dear Amazing Computing:

Let's talk about file requesters! There are a great many ways to allow an Amiga user to select a disk file, and the differences between them can add up to a colossal savings (or waste) of the user's time. My pet peeve is the Deluxe Paint style of requester (sorry, Electronic Arts, you created a masterpiece EXCEPT for your file requester!) It makes assumptions about two things: first, that it knows which device your picture is on, and second, that you are too lazy to type in the name. A typical scenario: you select LOAD from the top menu; Drive 0 grinds away incessantly, finally providing you with a menu of the WRONG disk. You click on DF1:, and 30 seconds later a new list of files complete. You can do nothing until the grinding ends. Now you scroll through the list to find your file, click on it, and click OK. I thought the mouse interface was supposed to be convenient.

A slight improvement is the Scribble!/TxEd style of file requester. At least it doesn't make you wait for all disk activity to stop before allowing you to choose a new path. Sometimes I'm actually able to scroll-search for the filename during disk access. More often, the filename vanishes just as I position the mouse arrow to click. On other occasions, I choose to type in my filename, fighting the distractions of the drunkenly flashing cursor and the ever-changing file list.

And then there is the Maxiplan requester, not perfect, but the best I have yet found. It actually stops and ASKS YOU IF YOU NEED A DIRECTORY. What a concept! If you want to search your disk for files, you click your mouse pointer in the menu window to begin. You may first select a different device or pathname. You may even (how antiquated an idea!) type in your filename yourself instead of scrolling through a list and clicking. But until you authorize it, there is no disk activity at all - just beautiful silence.

I hope I haven't insulted anyone needlessly (I would actually like to see some software developers improve their file requesters, to make the insults worthwhile). And I don't believe the ultimate design is here yet. Why not a requester that waits for you to intiate a disk search (with a DIR button), and also allows you to select a file at any point during disk activity? I would also like to see DELETE, RENAME and MAKEDIR part of the file requester standard format, so that proper disk housekeeping can be done. Let's keep in mind that it's our time and our disk drives at stake, and get the most convenient file access possible.

Sincerely,
Dick Bourne
Canada

Hang in there. Perhaps with a great deal of user feedback, we can get all developers up to speed with the Amiga. However, do be kind, it is not entirely their fault. They probably have never had this much machine with this many opportunities before.

We welcome your comments!

All readers who have letters, questions, or comments printed in AC receive a certificate good for 5 free Public Domain Software disks.

Keep involved, Please write us!

Bear Time

By Steve Carter

Time-of-Day Clock

Bear Time is another entry in the Amiga 1000 Battery backed clock market. By itself, that news is not particularly noteworthy, since several are available already. But there are several features that set Bear Time apart from the rest of the crowd. As you read, I'm certain you will find at least one good reason to own a Bear Time; I found a couple. Let's take a brief look at some of its features.

Like all the rest of the Amiga 1000 clocks, Bear Time needs a place to live, but unlike the rest, Bear Time doesn't occupy a port. Similar to products that use the 68000 socket, Bear Time uses one of the PIA sockets next to the 68000. You simply remove the PIA, plug it into the Bear Time board, and plug the board into the PIA socket. Now, Bear Time is ready to run, without interfering with the printer, the mouse port, or any other port.

The software required to run Bear Time is quite flexible. It allows you to include a simple command in your startup-sequence to get the time. Or, if preciseness is your cup of tea, you can use a different version which keeps time accurately (including daylight savings time and leap years).

Perhaps the most attractive feature is its price. The kit is just $17.50. And if you don't want to trouble with the relatively simple assembly, Bear Products charges $10 to assemble and test it. At this price, a good argument could be made for replacing the clock that keeps messing up your ports.

Enough of the hype; I'd like to tell you about putting it together and installing it.

The kit contains eight parts, and is slightly smaller than a 3.5" diskette. You need a low wattage soldering iron, solder, and a couple of other common tools. Assembly is simply a matter of soldering the parts onto the board. Bear Time comes with illustrated, easy-to-follow assembly instructions. It took me about an hour to assemble mine.

The kit method has a couple of drawbacks. Even if you're a novice at soldering, you really shouldn't have any problems. However, there are a number of solder points to make, and if you don't do a good job, you could be faced with checking out each point for a bad connection. Of course, the other drawback is the time involved. Anyone experienced in this area will not have a problem, but novices might consider paying an extra ten bucks to have it done for them.

Installation is not an easy job, but even if you have never opened your Amiga before, you should do fine. The instructions are illustrated and easy to follow. Once the machine is opened, remove the metal RF shield and locate the chip to remove from the motherboard, place it in its socket on the Bear Time board, and insert the Bear Time plug in the empty PIA socket.

The only place to get hung up here is in removing the PIA chip. Some of these chips (mine included) can be in the socket really tight. Remove the disk drive in order to get at the chip with a screwdriver. With a little gentle prying I was able to loosen the chip and remove it with an IC puller. It is important to note that great care must be taken when using the screwdriver method to insert the blade between the chip and socket. This way you will not be touching the motherboard with the screwdriver and running the expensive risk of damaging any traces.

An alternative to removing the disk drive is to remove the plastic back panel. But this requires the use of a long small-blade screwdriver. I was able to use a 4" screwdriver after removing the drive, as the chip is close to the drive.

Once the board is in place and the drive is reinstalled, test your Kickstart screen. Once this is accomplished, the machine is reassembled and you're ready to try out the software.

As I mentioned, the software can be as simple or complex as you wish to make it. If all you want is to know the time, and accuracy is not a priority, than you can use getbt_sm. You include the command in your startup-sequence and forget about it. From there on, your Amiga will always know what time it is.

If you are concerned about accuracy, Bear Time gives you a second program, getbt, that allows you to achieve accuracy to within a few seconds per year. This requires some tweaking of the getbt command line arguments over a period of time. The process involves calculating the inaccuracy of the clock and adjusting for the difference in the command line arguments. You may also include the day and month when daylight savings time begins and ends.

Whichever method you choose, the Bear Time must be set first. This is done using a menu/mouse driven program appropriately called SetBT. You are warned do to this only once. Jot down the hour, day, month and year when SetBT is run, and these numbers are used in the command line arguments of GetBT.

All in all, I am very pleased with the clock and have been running it for a couple of months now. It has not interfered with any hardware or software I own, and is advertised to be completely software and hardware compatible.

There is one exception to the hardware compatibility, and it involves products that use an adapter for the 68000. I have Michigan Software's Kwikstart installed, which uses a board that plugs into the 68000's socket and hangs over the PIA chip which the Bear Time uses. This almost eliminates the ability to plug the Bear Time directly into the PIA socket, but I worked up a plug and cable and put the Bear Time out of the way. This fix is not recommended by anybody, but it is working for me. I heard a new design is in the works for Bear Time that will eliminate this problem.

Bear Time comes with Assembly, Installation and Software instructions and a disk including the required software. The disk also includes a Hackers Drawer, containing information on the theory of Bear Time accuracy.

Bear Time was formerly known as Time Lord from Amazing Devices, but was recently acquired by Bear Products and released as a kit. The kit is available only through Bear Products.

•AC•

Bear Time Kit	$17.50
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Bear Products (formerly BareBoards) is a small company devoted to the Amiga and low cost hardware for it. They also have a 2 MB memory expansion kit available for the Amiga 1000, and one coming soon for the 500.

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Take Five!

By Steve Hull
GEnie: LightRaider
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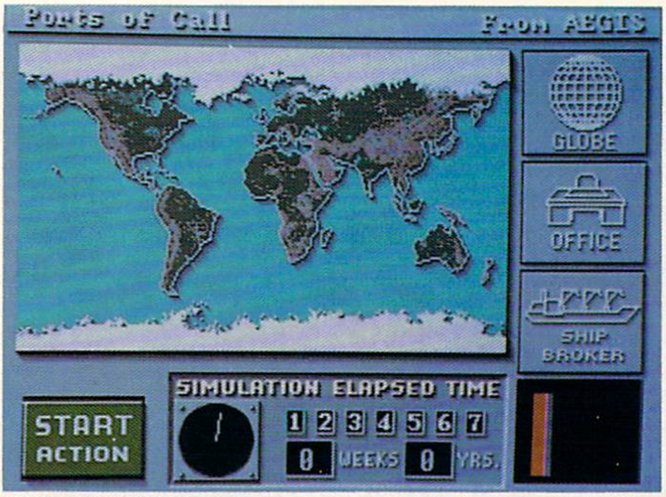
It seems like only yesterday that media pundits were loudly announcing the death of the videogame. Things did look tense for a while; the demise of ColecoVision and Intellivision were poor harbingers indeed. Atari's would-be successor to the 2600, the 5200 game system, died a slow and ignominious death amid the roar of bulldozers burying surplus cartridges. The Atari 7800 SuperSystem, which could have been the rage of 1985, instead fell by the wayside during the Warner Communications/ Tramiel changeover. By the time the 7800 wobbled out of the warehouse two years later, Japan's Nintendo captured the new generation Atari had ignored.

What many in the press did not seem to realize was, videogames were alive and well on personal computers. The C64's and Atari 800's that flooded into homes offered superior graphics and sound, and computing power that the dedicated game systems could not match. It is true the industry has ebbed a bit from the madhouse days of the early 80's, but this was more a stabilization than a recession.

Get ready for the next boom. Games for the Amiga have turned hot, and everyone wants in. Small development corporations are popping up like weeds; entrepreneurs are grabbing programmers and artists, building stables much like the movie moguls of the 30's and 40's did. As I survey the scene, I feel as if I am standing at the foot of an enormous tidal wave that is about to break.

This June's Consumer Electronics Show is a case in point (see sidebar). Companies like Epyx, which until now offered the Amiga only marginal support, are jumping in full-force. Companies like MicroIllusions—which have been strong on the Amiga—are doubling their commitment. I hope everyone out there's wearing seatbelts!



PORTS OF CALL

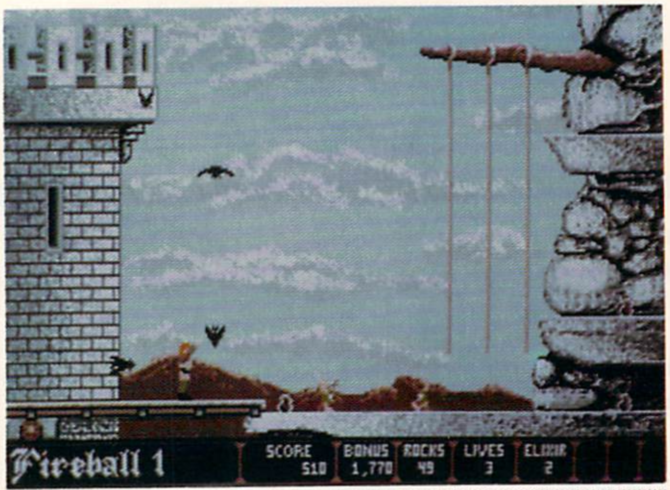
CAN YOU KEEP A SECRET?
Silent Software—the company that produced Fire Power and Turbo for MicroIllusions—is working on what could be some of the most fascinating Amiga projects to date. Among these: a series of stories for the adult sci-fi/ fantasy magazine Heavy Metal, done completely on the Amiga. Videoscape/screen hack wizard Leo Schwab is among those said to be involved in the project; he'll be doing the 3D routines.

Silent Software's founder, Reichart Von Wolfsheild, is in the process of joining resources with an established programming team in what is shaping up to be a veritable programmer's guild.

"Jackets are being produced...business cards are being printed...software is being designed." When asked for names, Reichart answered simply, "the best." You could hear the gleam in his eye over the phone. A Fire Power sequel—Return Fire—and the Sachs version of 20,000 Leagues Under the Sea are likely first projects.

GIVE THESE GUYS SOME SANKA
In other news, Teknoware, a southern California startup company, will be kicking off their Amiga line this summer with two attention-getters: Freeway Massacre, a "fast driving, hardhitting California freeway simulation in which you play the Freeway Vigilante" and Kill or Be Killed, an arcade-style POW rescue described by its developers as "a disk full of violence." Geeez, fellas, maybe you should lay off the caffeine for a while!

NEWS SHORTS
As of mid-April, Cinemaware was just-this-close to signing a deal with the Disney organization. The project? Cinemaware boss Bob Jacob won't go on the record until the deal's done. I can tell you this: it isn't Roger Rabbit ... Sales of 360 Pacific's Dark Castle have been brisk enough to merit a sequel; look for an Amiga version of Beyond Dark Castle sometime around September or October ... Speaking of sequels, Discovery Software has added 33 new levels to their wall-banging smash, Arkanoid. Registered owners



DARK CASTLE

of the original will be able to upgrade, though at this writing the cost has not been decided. Discovery hopes to have Zoom, an arcade space chase, on the shelves by the time you read this ... Microdeal U.K. is working on a videogame adaptation of the movie *Fright Night*. Little else is known at this time; Microdeal U.S.A. has seen screen shots, but that's about it.

Enough news—let's hit the reviews!

GAME OF THE MONTH

Tonight, before you nod off to sleep, bow your head and give thanks that you are not a game developer. These poor folks spend months and risk thousands of dollars trying to figure out what will appeal to the game-buying public, and there are no sure formulas for success. Witness what may turn out to be the sleeper of 1988: a business simulation!

Aegis Development's *Ports of Call* has only been out a few months, but it has already become a bit of a "cult" item; stories of severe addiction began popping up on the networks almost immediately after its release. One unsuspecting individual popped the disk into his Amiga one afternoon and didn't come up for air until the next morning, when he had to make a dash for work! A friend of mine has amassed a fleet of 250 ships and is threatening to upload the scenario to bulletin boards and drive everyone else nuts. My favorite "Portsocolic" story concerns the programmer working for a competing company who had to physically destroy the disk so he could get some work done.

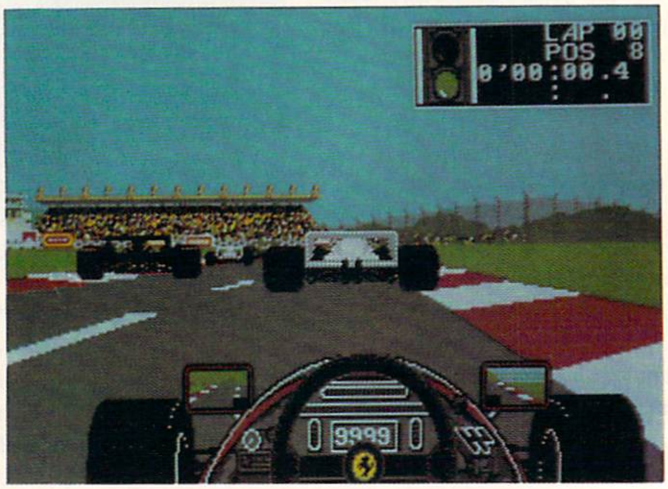
Ports of Call allows up to four players to try their luck at the business of global shipping. Each player begins the game as the head of a shipping company, with five million dollars in starting capital. The object of the game is to build your company's status through a combination of business sense, management, and no small measure of seamanship.

It sounds dry, but the game is seductive. A lot of research went into Ports of Call; Martin Ulrich and Rolf-Dieter Klein spent over two years touring ports on every continent, gathering facts on all aspects of international shipping. From Piraeus to Singapore, to London's Baltic Exchange—the New York Stock Exchange of tramp steamers—you might say these guys did their homework. The original documentation filled 50 pages, but was trimmed to about 13 for the game's release. You won't feel shorted; it's all in the game.

Once you acquire a ship, the next step is to charter a cargo. Depending upon where you are ported at the moment, the country's exports might be agricultural products, nonferrous metals or electronics. You also have a choice of destinations needing these commodities. The trick is to match cargoes and destinations to assure the highest profit for the voyage.

Both shipping rates and expenses fluctuate in response to factors as diverse as crop yields and competition; each company's credit rating rises or falls on its owner's decisions. Success may be achieved through widely varying strategies. You may take the high road, investing in modern, well-maintained superships, or you can buy a rusty old bucket and run it until it sinks.

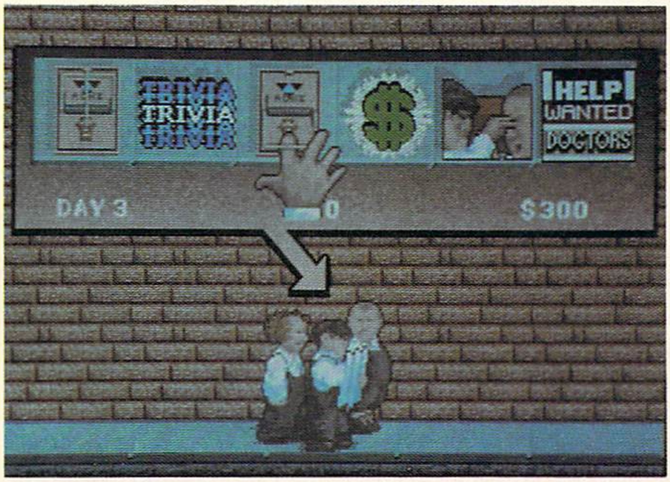
Like the real world of tramp shipping, Ports of Call is never predictable. Rats may infest your hold, or an epidemic may result in your ship being quarantined offshore. Dockside pirates will steal your cargo while you're laid up, and white-collar pirates will dip into the till if you don't keep close tabs on the home office. Heavy weather will force you to decide whether your ship can brave the storm, or whether you can afford to cruise the long way around it. Unsavory characters will tempt you with outrageous sums to ferry just "a handy little chest"—putting you at risk with customs. Then there are taxes, fuel, repairs, mortgage on your ships and much more.



FERRARI FORMULA ONE

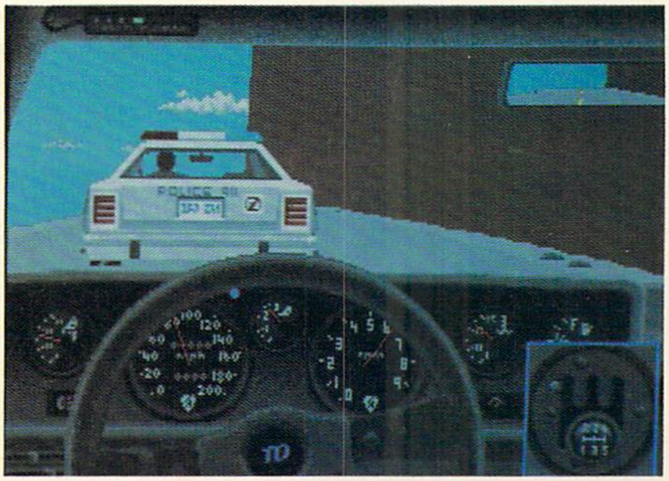
Those looking for action should look elsewhere. Ports of Call has a couple of sequences that some might term "arcade," but these are more in the vein of Lunar Lander than Space Invaders. Taking the helm to navigate your ship through hazardous reefs, for example, requires a steady hand, patience and skill. Docking the vessel will conjure painful memories of parallel parking from old Driver's Ed. days. And of course, there's a big difference between sidling up next to a curb in a Volkswagen Rabbit, and easing several thousand tons of cargo ship up to the dock. Each port is different, and some are worse than others—I am positive that the port at Basrah was designed by a sadist!

The first release of Ports of Call includes a little bit of unintended realism as well; it is possible, through savvy speculation and observing fluctuating ship prices, to build a veritable armada without ever setting sail! Word has it the programmers are planning to make a slight adjustment to the next release to make such speculation unprofitable.



THE THREE STOOGES

Lush artwork by Dick LaBarre and Jim Sachs makes Ports of Call easily the most beautiful simulation ever attempted on a microcomputer. Aegis took quite a risk in bringing this title to market; in doing so they have not only produced a playable game, but educational software of the finest sort.



TEST DRIVE

Dark Castle, the initial Amiga release from 360 Pacific, was first written for the Macintosh, where it garnered high sales and favorable reviews. The Amiga version builds on the Mac game with color and digitized stereo sound. The game comes on two disks, and though it can be played on one-disk systems, you can expect lots of disk swapping.

The goal in Dark Castle is to survive fourteen screens of action-packed arcade challenges: you will face dungeons, laboratories, caves and other such inhospitable locations. Your opponents include marauding bats, hungry rats, burning eyeballs, and the obligatory fire-breathing dragon. At the end of it all, you will have to defeat the Black Knight. If you get the impression this isn't exactly Mr. Roger's Neighborhood, you're right.

You start out with five lives, a sackful of rocks for defense, and elixirs to restore your health. Throughout the game you may find more elixirs, treasures and weapons to aid in your success. There are three skill levels to choose from, and high scores are saved to disk.

The series of screens accessed through the Info gadget are extremely helpful—in fact, you probably won't get very far in the game without studying them. Besides offering hints, the screens show keystroke combinations for actions which are not mentioned in the game's brief documentation.

Dark Castle's digitized sound is great. From the surprised squeak of downed bats to taunting ravens (the docs call 'em "vultures," but don't you believe it), the sound effects add originality and humor to the game. In my household (a home long ago used to the cacophony of laser blasts, tank rumblings and alien growls emanating from the computer room), Dark Castle brought people from other rooms saying, "what is that?"

Gameplay is extremely rich, combining elements of the arcade classics Galaxian, Donkey Kong (Sr. and Jr.), Jumpman, Jungle Hunt, and others. It would not be overstating to say that Dark Castle combines the best collection of arcade sequences in any Amiga title to date. Unfortunately, there's a catch.

Dark Castle has an Achilles heel—its play mechanics are perhaps the clumsiest and most daunting yet encountered. It's not that it lacks options; you have the choice of playing by joystick, or by a combination of keyboard and mouse. However, trying to get the game to respond to the joystick is an exercise in frustration; the smallest task, such as climbing stairs, takes several attempts and much joystick jiggling.

In addition, nearly a dozen different actions are controlled through various combinations of stick position and the fire button. In the heat of battle, you may find yourself asking, "am I supposed to push the button down then push up, or left, or..."

Control via keyboard and mouse is significantly more precise, a result of the game's Macintosh heritage. Still, you are expected to keep one hand on the mouse while the other hand manipulates seven keys. Considering all that happens on screen, there isn't a lot of spare time for glancing at the keyboard. If you're a touch-typist, you'll love it.

Veteran gamers—especially those who grew up with Apple II's—have seen keyboard-oriented arcade games before, and may not consider this a problem. Dark Castle is a very good game, but its play mechanics may make it inaccessible to some. I recommend the game to advanced arcade fans—but not to beginners.

Ferrari Formula One is Electronic Arts' latest entry under their Sports Legends series. Like EA's previous Sports Legends title, Earl Weaver Baseball, Ferrari Formula One was written for fanatics. Those people who eat, sleep and breathe Formula One class racing may risk losing all contact with civilization over this title. On the other hand, if you buy Ferrari Formula One expecting an arcade game, you will be disappointed. It is a simulation—without question the most complete of its kind ever attempted.

On the surface, Ferrari Formula One appears to have a lot in common with Pole Position. In reality, that is like comparing Sublogic's Flight Simulator II with Gee Bee Air Rally. We're talking a quantum leap in sophistication here.

Ferrari Formula One can be played on many levels. If you simply want to get out on the track and run 'til your tires melt off the rims, you can. You'll be missing the point of the game, but you can. At its most involved, Ferrari Formula One gives you the opportunity to pilot your F1/86 through an entire season of 16 courses in locations around the world. Success requires more than raw driving skill; a little feel for engineering helps a great deal.

You begin preparing for the season at your test track at Fiorano, Italy. Fiorano serves a dual purpose; it has the facilities needed to test and perfect the ideal configuration of your car, and also a track on which you may develop your driving skills.

The level of detail to the game is staggering. In the Dyno room, you can test various fuel mixtures, monitor the cooling and electrical systems, and graph the effect of changing engine control ROMs. Yes, real Ferraris use computer chips to optimize the engine for efficiency or raw power. You may change the suspension, gear ratios, or mix and match between six tire compounds. There is a wind tunnel, which you will use to adjust the car's wings for the perfect balance between downforce and drag. Fortunately, designer Rick (Racing Destruction Set) Koenig had enough mercy to include a computerized crew chief—Mauro—to offer expert advice.

Ready to race now? Not so fast, A.J. You must make it through a series of five track sessions before you get to play for keeps. There are two practice runs and two qualifying runs in the days leading up to the race, plus a 30-minute warmup on the morning of the real thing.

"Thirty-minute warmup?" I heard someone gasp under his breath. Yes, in Ferrari Formula One, everything short of repairs and international travel is done in real time. A regulation Grand Prix race covers approximately 310 kilometers, or about two hours. That works out to about 120 Earth-minutes on your Amiga! Ferrari Formula One doesn't cut corners, but you can if you want to—its Race Control lets you trim down races to as few as 18 kilometers. That's a thoughtful addition for those who can't afford to make this game a career. You may also stretch a season over several sessions by saving your current standings to the disk.

Overall, does Ferrari Formula One "work"? Sort of. Many people will enjoy getting in and tinkering with the car's specs. However, the action sequences are pretty weak. The race graphics are only so-so, and the sound bears greater resemblance to a Sunbeam blender set to puree than a full-throated Ferrari turbo. Finally, the mouse proves to be a truly miserable control device for a driving simulation.

If you're a true racing fan, interested in the intimate details of life on the Grand Prix, run, do not walk, to your dealer and pick this one up now! On the other hand, if you're looking for real whiz-bang driving action on the Amiga ... I'm afraid such a program has not yet been written.

Accolade's Test Drive is escapist fantasy at its finest—the chance to demolish several million dollars' worth of fine sports cars and live to tell the tale!

Actually, demolishing Lamborghinis and Porsches is not the object of the game, just an entertaining fringe benefit. Test Drive offers the unlikely scenario of a car dealer allowing you to check out the pick of his lot, including such heady machines as the Lotus Turbo Esprit, Ferrari Testarossa, and for buy-American purists, the Chevy Corvette. A responsible citizen, you promptly grab the keys and beeline it for a leisurely 120 mph run to the top of a mountain known only as The Rock. Now we know why daddy took the T-Bird away.

The game begins with automobile selection. Each of the five cars may be viewed, along with a collection of stats as complete as anything you're likely to find this side of *Car & Driver.* Such esoterics as engine torque and compression ratio are displayed, along with performance characteristics such as braking distance and acceleration. Once you've chosen your beast, you're ready to begin.

Play takes place from a driver's eye view behind the wheel; the object of the game is to push your machine as hard and as fast as you dare, while avoiding collisions with other traffic or The Rock.

No muscle car would be complete without the appropriate protective device. Seatbelts? No—a radar detector! This one's pretty good, too, and it sees around corners better than most real ones do. It tweets when you're being clocked, and displays a series of red LED's; when all are lit, Smokey's takin' your picture.

At the first tweet of the radar detector, you may either slow down (Wimp!) or hit the gas and get out of there with all haste. Sometimes the cop doesn't appear, but other times he'll be in your rear-view mirror with his bubble-gum machine flashing bright as you please. You may then meekly pull over (Wimp!) and accept your ticket, or try to outrun him. Contrary to what you may have read in other reviews (Wimps!), it can be done—though if the police car gets in front of you, cut your losses and park. There's no way to get by it, and rear-ending the cruiser earns an automatic GAME OVER.

The game's graphics are a mixed bag; the cars are detailed both inside and out, though the view outside the windshield is simpler. The engine sounds are more convincing than those of Ferrari Formula One, but that's not really saying a lot. The sounds are identical for each car—and anyone who thinks a Porsche and a Corvette sound alike needs to get his ears dyno-tuned.

Gameplay is pretty simple—you're basically maneuvering a never-ending right-hand curve. You have control over acceleration, brakes, and shifting. Each car has a functioning speedometer and tachometer; you will learn to observe the latter after blowing a few engines!

The way Test Drive handles mishaps is pretty lame; whether you blow the engine, sail off the side of the mountain or collide head-on with a truck, the windshield shatters and the sound trails off. Ehhh. On the other hand, the programmers worked in a few nice touches, like bugs splatting on the windshield and the staccato thuddathuddathudda when your tires cross the raised highway markers. One of the better effects occurs when your car tops a rise in the road; it'll make your stomach lurch!

Though Accolade bills Test Drive as a simulation, there are certain instances that, frankly, defy belief. You know

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laws of realism have been hopelessly suspended when the road widens to allow a passing lane, and the Sunday-driver in the blue microbus actually pulls over and lets you by. That never happens in real life!

I didn't care for Test Drive at first, but after playing several times it has grown on me. Those looking for an intellectual challenge would be better off trying Ferrari Formula One, but if you're looking for a good way to blow off steam without sending your car insurance premiums through the roof, Test Drive is the way to go.

The documentation to Cinemaware's *The Three Stooges* begins with a quote from Leonard Maltin that I would like to lift shamelessly: Maltin points out that people can be divided into two groups, "one composed of persons who laugh at the Three Stooges and one made up of those who wonder why." It's hard to improve on a thought like that.

Cinemaware's newest title, produced under license by Columbia Pictures, is aimed squarely at the first group—though like a thrown pie, it may hit the second group also! Three Stooges is a crazy, light-hearted romp that will appeal to Stoogeophiles (their word, not mine) and the uninitiated alike.

As the game opens, the Evil Banker (pat. pend.) appears at the door to Ma's Orphanage, threatening to (what else?) foreclose. Ma is distraught. The pitiful orphans are distraught. The Stooges appear on the scene and promise to save the day. Now Ma and the orphans are really distraught.

Three Stooges is, at heart, an expertly-designed computer translation of a board game. In it, Larry, Moe and Curly attempt to earn, win or otherwise find the money to save the orphanage. To determine the direction the game takes, the Stooges crowd around a map, while above them an enlarged view shows Moe's hand randomly jumping between alternatives such as HELP WANTED WAITERS, BOXING, or TRIVIA. You select by pressing the fire button at the precise moment that hand lands on the square (if you take too long, the game chooses for you). Stopping the finger where you want it is easy at first, but the farther you get into the game the faster the hand moves. There are also mousetraps on the map, and if they snap on Moe's fingers too many times, the game's over.

Moe's finger can be slowed by knocking some sense into Larry and Curly; the joystick comes into full play as you fake, duck and slap Moe's cohorts. The hand slows a bit each time you connect—but if you miss, speed increases. The slapstick action, plus Moe's digitized voice rasping, "YOU IDIOT," make this portion of the game as much fun to watch as it is to play.

The Three Stooges' arcade sequences are the most playable seen in a Cinemaware title yet. All are based on sequences from Stooges' films, and in many cases actual digitized sounds and graphics from the movies are integrated into the action.

There is the inevitable pie fight in the Hoiti Toiti Club, where the Stooges obligingly serve pies to three high-society types who demand, "LET ME HAVE IT!" Points are awarded for pies "delivered" (ahem), but the hoiti-toitis shoot back, and five bullseyes end the scene. There is a hilarious hospital scene taken from the Stooges' best Columbia short subject, *Men In Black*, where the three race after a demented nurse, swiping dropped medical supplies and leaving mayhem in their wake. There's more—a hilarious scene from *Dutiful But Dumb* where Curly attempts to steal crackers from hungry oysters in a bowl of soup, and a challenging urban obstacle course for Larry... but don't let me spoil it! Beside arcade challenges, you may earn points by successfully answering multiple choice questions on Stooges' trivia.

The sound, music, and graphics are extremely well done. In addition to the artists and programmers responsible, it is no accident that Cinemaware audio and video compression specialists are also credited right up there with the producers in the opening credits.

There are few things I don't like about this game. The pause feature is weak; like King of Chicago, you pause when the game lets you, not when you want to. Cinemaware recommends two drives; though the game will run on one drive, the frequent disk swaps kill the mood. Even with two drives, disk access slows the game's pacing, though Three Stooges may be installed in expanded RAM or on a hard drive (using the key disk method to start) if your system is so equipped.

Let's face it, these are quibbles. Cinemaware has pulled off quite a feat with this one—a truly funny computer game. As with the Three Stooges themselves, there are going to be those who love this game and others who wonder why. But that first group's gonna be big.

PORTS OF CALL Aegis Development
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1 - 4 players

DARK CASTLE 360 Pacific 2105 S. Bascom Campbell, CA 95008 (818) 905-0851 $39.95 1 player

FERRARI FORMULA ONE Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 $49.95 1 player

TEST DRIVE Accolade Inc. 550 S. Winchester Blvd Suite 200 San Jose, CA 95128 (408) 296-8400 $44.95 1 player

THE THREE STOOGES Cinemaware Corp. 4165 Thousand Oaks Blvd Westlake Village, CA 91362 (805) 495-6515 $49.95 1 player

•AC•

CES Games Preview

MicroIllusions is going to turn some heads at June's Consumer Electronics show with the announcement of an exclusive and unprecedented agreement with the cartoon giant, Hanna-Barbera, to produce videogames based on the characters Scooby Doo, Johnny Quest, the Flinstones, and the Jetsons. Look for at least two titles, and perhaps all four, by year's end. MicroIllusions' dungeon adventure, Land of Legends, should be hitting the streets as you read this, with the followup title, Dungeon Construction Set, expected by July. DCS allows you to create dungeons with many levels and mazes—and design horrific critters to wander 'em!

At CES, Accolade will announce ports of three games to the Amiga. Pinball Wizard fulfills the promise Electronic Arts made three years ago to produce Pinball Construction Set; Accolade's version features five ready-to-play games plus a game builder. Mini-Putt takes Mean 18's user interface to the miniature golf course; no sandtraps, but then, Mean 18 didn't make you deal with windmills either. In 4th and Inches, Accolade brings to the gridiron the kind of realism it introduced in Hardball; players may challenge each other, or go head-to-head against the computer. A 4th and Inches Team Construction Set planned for August release will let you build any team player-by-player, right down to the names, jerseys, positions and individual characteristics. Think of the fun you'll have pitting your high school's cross-town rivals against the Dallas Cowboys! Accolade plans to include its own office staff—"The Accolads"—on the disk.

Epyx's CES announcements are expected to show that the company is serious about making up lost time on the Amiga—only fitting, as Epyx Chairman and CEO David Morse was the founder of Amiga Computer! Those were the old days, when Jack Tramiel's secret plan for capturing the market revolved around the Commodore 16...but enough reminiscing...

Final Assault is a mountain climbing simulation, with realism assured by technical consultant Eric Escoffier, a world-class climber. Aspiring Sir Edmund Hillarys will have the choice of climbing rock cliffs or glacial ice; success hinges on skill, but also on how well you prepare for the climb. You must pack a rucksack, choosing from 50 items ranging from pitons to provisions. Fortunately, a training slope is included.

Epyx has licensed the search-and-destroy contest Battleship from Milton-Bradley, with plans for third quarter release. Street Sports Football stars the kids in the neighborhood facing each other on a field of battle that includes puddles, oil slicks, and cracked sidewalks. Street Sports Basketball is also expected to be released within six weeks. Tower Toppler is an intriguing game of skill that takes place on a rotating 3D tower. The object of the game is to make it past obstacles like crumbling ledges and hostile creatures, then destroy the evil machine at the summit. Techno Cop enlists players as members of an elite police force. Your equipment includes a computer wrist- watch, high-tech automobile and the ever-useful criminal radar locater. Your mission: Nab the vermin! Chief vermin: The international crime family, D.O.A. Sounds socially redeeming...

The Game: Summer Edition (not to be confused with Epyx' successful Summer Games) is a series of Olympic contests set in Seoul, South Korea. The game's designers have tapped experts from the United States Olympic Committee, and are currently studying miles of videotaped of Olympic events. Among those tentatively planned: the high-speed bicycle velodrome, archery, springboard diving, and miscellaneous track-and-field competitions. This ambitious effort is also slated to include such gymnastic events as the uneven parallel bars and rings, though the latter is proving to be a real trick to program. The Game: Winter Edition, is also in the works.

Coming in under Epyx' U.S. Gold line, Sports-a-Roni, a game featuring a series of nonsensical games of skill set in various locations throughout Italy. Among those mentioned: Pasta-plate balancing in Pisa, and a gondola-bound pillow fight on the canals of Venice!

- Steve Hull

Hot on the Shelves

by Michael T. Cabral AC Co-Editor

Speedy DOS Delivery

Thanks to **Ultra DOS Utilities, Module 1** by Free Spirit Software, you can halt the head-spinning confusion of hard drive backup. Unique file handling capabilities allow you to pass files with speed, coherence and grace. Even if you aren't blessed with a hard drive, this product is quite useful—it works with floppies, too.

A Workbench-like, gadget geared environment simplifies many of the hard drive features included here. Pathnames up to a whopping 250 characters can be displayed, and copy buffer size is fully adjustable. Both batch and standard copy modes are supported. Autoconfiguration allows smooth batch processing across drive or partition boundaries.

Ultra DOS Utilities, Module 1 supports up to 8.5MB of memory, operates in the background to free up CPU, and is compatible with all AmigaDOS protocol hard drives. If you deal in a lot of backup and file transfer, check this one out.

Ultra DOS Utilities, Module 1
Free Spirit Software, Inc.
905 W. Hillgrove, Suite 6
La Grange, IL 60525

Asteroid Attack!

An ornery asteroid has Earth by the throat. **Black Shadow** by Scorpion, an arcade-style space blast, challenges you to break that grip.

You zip over a scrolling backdrop in your sleek spaceliner, avoiding fire from both ground installations and airbound enemies. The flying nasties come in all sorts of shapes and sizes. A clone of the red and white patterned Amiga ball even menacingly floats by now and then. You're equipped with bombs to take care of terrestrial terrorizers and an endless supply of gunfire to strafe on-coming objects. If you're into seeing the fruits of your destruction, blasting a ground installation leaves a satisfying, smoky crater.

If you feel outnumbered by all those enemies, grab a partner for simultaneous play. You can work together to wrangle Earth away from the enemy asteroid or you can battle head to head for high score. Both mouse and joystick control are available. Whether you go it alone or blast in tandem, beware of ornery asteroids.

Black Shadow
$34.95
Scorpion
19 Harbor Drive
Lake Hopatcong, NJ 07849
(201) 663-0202

No More Fishing For PD Programs

It's 11 P.M. Do you know where your favorite public domain programs are? With the Fred Fish collection at a hearty 138 and climbing, you probably don't have any idea where this or that program is. You can always check the microscopic catalog in the back of *AC*, but weary eyes beware.

Squint and hunt no more. Thanks to the Los Altos, California-based Amiga Science and Technology User's Group (ASCITEC), the *AC* catalog is no longer your only option. Enter **CAT FISH**, a complete, cross-referenced hard copy catalog of every niche of every Fred Fish disk. In addition to the standard descriptive listing, CAT FISH also includes a list of all alphabetically sorted files and a list of all files outlined by category. All sections include both page and disk number cross references. A section of CLI notes is also included for tips on accessing, reading, copying, or executing any PD disk.

The catalog is printed on both sides of 8 1/2" by 11" pages in laser printer quality that truly is a sight for sore eyes. The sheets are also three-hole punched for easy binder storage. If your addicted to catalogs on disk, ASCITEC promises a two disk set, with all the same features as the hard copy, as soon as Mr. Fish cranks out disk number 150. Snaggin' the right Fred Fish program can now be as easy as hookin' a crawdad on a lazy summer day.

CAT FISH
Complete Catalog $15
Blocks of ten disks available for 10 cents per page.
ASCITEC
P. O. Box 201
Los Altos, CA 94023

Space Age Gladiators

What do you get when you merge the gladiator sports of ancient Rome with the zenith of space-age technology? Why, **Ebonstar**, of course. This latest entry in the arcade-style space battle sweepstakes comes from Microillusions. Don't be fooled by the familiar premise, though—this isn't your run of the mill space game.

The Ebonstar corner of the galaxy is the year 3000's answer to the Coliseum. Here, gladiators, cased in fleet space crafts instead of armor, try to knock each other into a pre-fabricated black hole. Each ship is equipped with a bottomless cup of energy bolts to bump opponents closer and closer to the yawning abyss.

You didn't think it would all be that easy did you? Besides worrying about your own hide and vaporizing your opponents, you'll also have to contend with a bunch of nuisances. The Arch, the rough-edged computerized referee, releases ships from time to time to keep you from even thinking about trying to destroy the black hole. (You can temporarily zap it with a well-placed shot.) And these babies aren't called Rival, Inflictor, and Assassin, and Nemesis for nothing. Nemesis, the nastiest of the bunch, chases the player closest to it, hurls fireballs, and gets faster every time you temporarily deposit it into the pit. Arch does have a heart, though—a small one, but a heart nonetheless. It occasionally tosses objects that increase your firepower if you can track them down. Ebonstar can be played by up to four playersat once, and two-on-two matchups really test your ability to work as part of a team. Joystick, mouse and keyboard play are all supported and a handy Keyboard Reference Card is included. If you think you could have gutted it out as a Roman gladiator, test your mettle in this space-age fight for life.

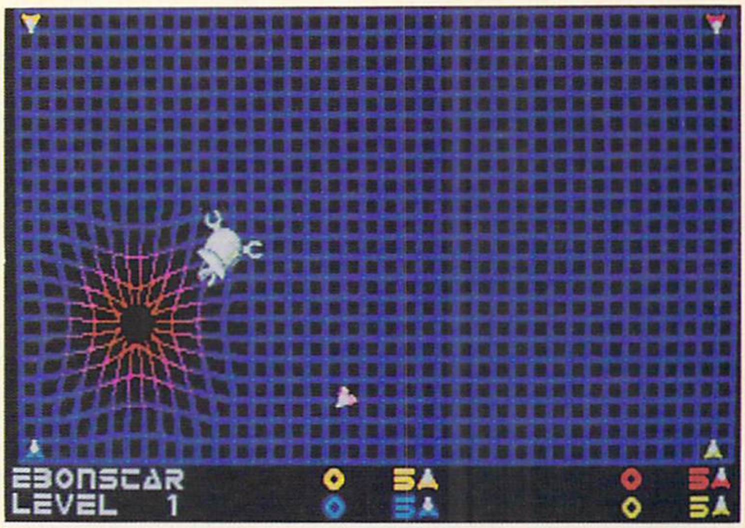
Ebonstar
$39.95
MicroIllusions
17408 Chatsworth Street
Granada Hills, CA 91344
(800) 522-2041

Cure Compatibility Blues

When Commodore decided to be a bit more "IBM-ish" in the designs of the ports on the A500 and 2000, hardware compatibility became an immediate issue. The change made to the parallel port was especially significant, since so much hardware was already on the market for the A1000, with its old-style parallel connect.

So, what's a hardware user to do when he upgrades to a 500 or 2000? Get in touch with Amicore International, makers of **Transvestor 1000**, **Transvestor 2500**, and **Transvestor 2500 Plus**. Transvestor 1000 attaches to the A1000 and allows the 1000 owner to use products designed for the 500- and 2000-style parallel port. Transvestor 2500 returns the favor for 500 and 2000 owners. With this connector, most products designed for the 1000 parallel port can be used by the 500/2000 owner.

The Transvestor 2500 Plus picks up where the Transvestor 2500 left off. A few A1000 products—Digi-View, among others—cannot be used on the 500 and 2000, even with Transvestor 2500, because of voltage problems. Transvestor 2500 Plus includes its own external power supply to bypass voltage glitches and make *all* A1000 hardware products compatible. Hardware compatibility is another problem you can now lay to rest.

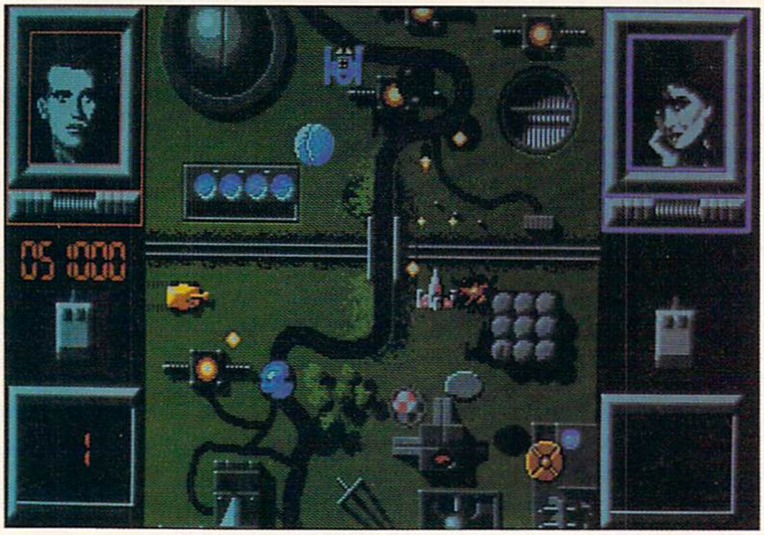


Ebonstar

Transvestor 1000, 2500 $19.90
Transvestor 2500 Plus $49.95
Amicore International
Exit 7 Plaza/451 Center Street
Ludlow, MA 01056
(413) 589-7879

Desktop Vidiots Delight

As desktop video continues to skyrocket as the hottest topic in the Amiga market, sparkling DV products continue to come out of the woodwork. The latest gem is **Deluxe Productions** from Electronic Arts, a professional quality, high-res video presentation program.



Black Shadow

Deluxe Productions allows you to combine hi-res graphics with incredible Amiga animation, and then use a complex storyboarding system to draft top-notch presentations. Your productions can have as many as twelve scenes, with up to five clips each. You can even chain productions together for long or looping presentations.

Overscan capabilities, which allow for borderless scenes and pause, forward, and backward functions, put you in undaunted control. Double buffering lets you boogie your titles across the screen with ease. As a director, you also have a rainbow-beating 4096 color palette, a broad selection of more than forty wipes (fades, spirals, scatters, and even venetian blinds) and a number of titling fonts at your creative disposal. You also have full control over object speed and path, color cycles, transitions, and timing.

Deluxe Productions is IFF compatible and includes a hard drive installer. Also thrown in to get you started are three art disks. Hi-res background objects for business presentation and news broadcasting and three sets of fonts are included here. If your presentations could use the kick of smartly animated graphics, give Deluxe Productions a look.

Deluxe Productions
$199.95
Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
(800) 245-4525

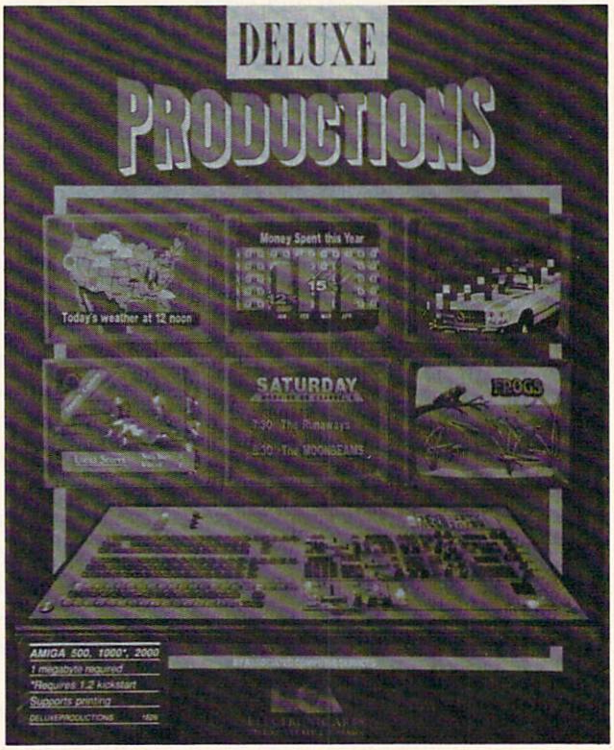
Improve Your Image . . .
Your image processing, that is. **Photosynthesis,** a full image processing system from Escape Sequence, Inc., puts a many operations at your fingertips without a whole lot of hardware. Up to four 16-bit 320 by 200 images, signed or unsigned, can be stored simultaneously. Photosynthesis accepts the images in IFF, ASCII, or a versatile Photosynthesis format that keeps pace with IFF and allows for signed images.

The package also includes a unique interpreter that allows you to draft your own image processing algorithms. The interpreter borrows loops (For, While, Repeat) and conditionals (If, Else) from BASIC, and can run script files from other script files. Loops can be nested up to five levels deep.

Forty-plus menu options test the flexibility of the program and the image. A series of Boolean functions manipulate bitplanes to create the pointwise boolean AND, OR, XOR, or NOT of the input image. A Math menu produces an image which can be the pointwise ADD, SUBTRACT, MULTIPLY, or DIVIDE of the input image. AVERAGE, MEDIAN, and ABSVAL give quick calculations of the image's gray-level. A Relation menu lets you play comparative games with the gray-level. RGB gadgets and a gray-level color map are available for your manipulating pleasure. You can also CONVOLVE, EXPAND, SHRINK, THICKEN, THIN, or SKELETON the image for varied viewing and storage possibilities. Photosynthesis takes you almost any- where your "image-ination" wants to go.

•AC•

Photosynthesis
Escape Sequence, Inc.
P.O. Box 1101
Troy, NY 12180



Acquisition 1.3F

by David N. Blank

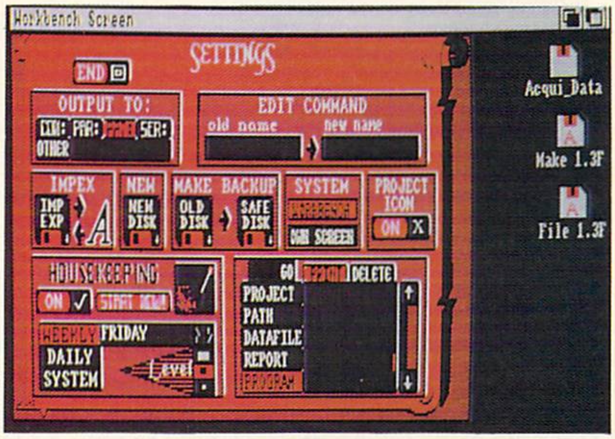
BLANK@BRANDEIS.bitnet
DNB@BRANDEIS.csnet

With the release of the latest upgrade to the relational database manager Acquisition 1.3F, Haitex Resources, in conjunction with Taurus Impex Limited, has brought the Amiga community the most powerful Amiga-specific database program to date. However, close scrutiny reveals some fatal flaws that cast a dark shadow on the brilliance of this news. This article provides an in-depth look at this relational database manager.

Common Ground

Before I discuss Acquisition, I would like to take a moment for a quick primer in relational database-speak. If you are already database-literate, please allow me the chance to match terminology with you. Now, onward to the land of jargon!

For this primer, I am afraid I will have to drag the standard classic example out of the closet and blow the dust off it. A database may be viewed as the computer equivalent of an index card file. Let's ignore the cries of "cliche" and consider an index card file containing the employee information for the salespeople of the Acme Llama Corporation. If we were to pull a card from the file for inspection, we would be looking at the paper equivalent of one database record. Printed on this card is an employee's name, position, department, phone number, and commission percentage. The information listed after each one of those headings on the card are fields. Filling out a card (i.e., a database record) for a new employee would consist of filling in a set of blank fields. Using a data entry form, a database can be displayed and edited on a computer screen. A form can be described as a window into a database through which one record is visible at a time. The database form can also act as mask, allowing the user to edit or view the contents of certain fields while keeping others hidden.



Settings

The contents of the database may be printed to paper, using a report. A report specifies how the data will look when it reaches paper. In addition, a report can also show the result of operations on the data, such as a calculation of the total of all values in a salary field of a database. The power inherent in a database is its ability to perform complex sorts, searches, and reports on data, a process that would take an incredible amount of time and effort if performed manually on index card file systems.

Now for the funky part of database management: relational databases. A relational database management program allows the user to keep multiple databases of related material and connect them in various ways. To illustrate its uses, let us return to Acme Llama Corporation. In addition to the employee index card file, the corporation also keeps a separate index card file containing personal information on all its employees. This file contains the name, home address, phone number, and hire date for each employee. There is an obvious connection between these two files: namely, one card/record in one file corresponds exactly to one card/record in the other (i.e. the employee card for Mr. H. H. Munro refers to the same person as the personal card for Mr. Munro).

The type of information in the two files is very different, but there is still a connection between the two sets of data. We could specify the "Employee Name" field as the link between the two, but this could cause problems if there were two employees with the same name on the staff. Frequently, to overcome this difficulty, a new field containing unique values to tie records together is added to both databases (e.g. an "employee number" field could be added). This is commonly referred to as a key field, and may be used for ordering the data as well.

(continued)

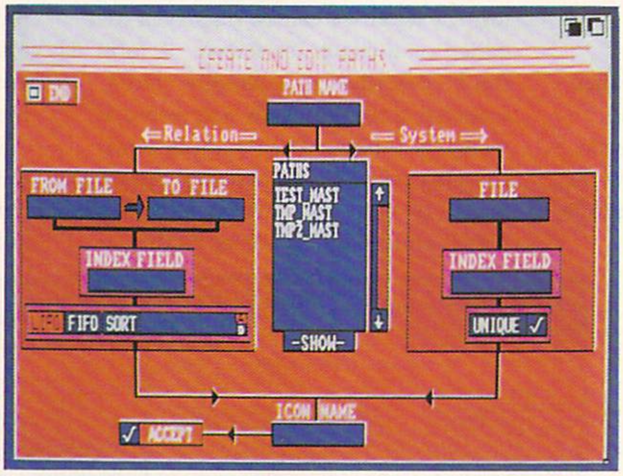
Following in the same mindset, a third index card file could be created, containing the set of records detailing each sale made by the company. In addition, each card could list the number of the employee responsible for that sale. At the end of the month, the database manager program, which takes the place of the index card files, could print out a paycheck for each salesperson based on sales commissions of products sold that month. It would first select a record from the employee database. From this record, it would extract the employee number and commission percentage information from their respective fields. It would then proceed to search through the employee number field of the sales database for sales made by that person, calculating commissions as it went along. Finally, the database manager would extract the address of the employee from the personal database and print a paycheck for that employee. This process would then be repeated for each person on the staff. A final report, summarizing all the checks printed that month, could be printed for the president.

A quick aside: all the processing described might seem a great hassle when all of the salesperson information could be kept in a single large database. This leads to the question of the necessity of relational databases. Relational databases are used primarily for one reason: it is easier and more efficient to work with smaller sets of data than it is to manipulate large ones.

One example can be found using our sample data sets. The president of the company may wish to see a list of salespeople sorted by department. With the relational database, one is able to sort the employee file without touching the data in either the personal file or the huge sales database. A sort on one small database is more efficient than one performed on a large conglomerate data set.

Go

Now that we speak the same language, a detailed review of Acquisition 1.3F can follow. The package contains three disks: MAKE (to create databases), FILE (to perform the actual management and reporting), and EXTRA (containing sample applications). A thick, spiral-bound manual accompanies the disks. The user must supply a disk to hold data. For a good look at this package, let's follow the example of the five blind men who attempted to describe an elephant, and take an excursion through the individual modules of the program.



Create and Edit Paths

In the Beginning

The Creating module is used to manipulate database skeletons. The user is presented with an empty field definition table. First, each field is given a name. The field name must be fewer than 15 characters long, all in capital letters. This encourages the use of capital letters for all interaction with the program, a throwback to single-case computers that I find distasteful.

A column for "stream" follows. A stream is a set of Acquisition command language (ACOM) commands executed when an individual field is accessed. (Streams will be described at greater length in the command language section.) The next part of the field definition calls for a specification of field type. Acquisition 1.3F has six distinct data types that describe the data to be stored in each field: numeric, alphanumeric, date, time, clipboard, and special. All but the last two are self-explanatory.

"Clipboard" fields contain the name of an IFF picture file that is attached to that field. This picture can then be loaded from or stored to disk and displayed at will. "Special" fields in this release have IFF digitized sound files attached to them. At first, I questioned the necessity of these two file types in a database package, but now I can envision several specialized applications that would make good use of them. The ability to store pictures with a record, in conjunction with an image digitizer, might come in handy. An inventory database could include a picture of each item along with the standard information.

I had greater difficulty searching for an application that uses digitized sounds. The game show application that comes on the EXTRA disk did not seem to warrant the necessary programming effort. This capability may be useful to a linguist who catalogues difficult vocal sounds, or to a speech therapist, but that is as far as my imagination will stretch.

The next heading in the field definition table is storage type. The two storage types are "field" and "memory." "Field" indicates that actual data is kept in this field and is stored on disk in the usual manner. The "memory" type, however, is one that I have not encountered in any other database package. A field designated "memory" contains data only for the time the database is active. The data is kept exclusively in memory; it is never stored to disk. It acts as a program variable constant. The manual gives a bank interest rate as an example since it needs to be entered only once per session.

(continued on page 28)

These Companies and 15,000 Amiga Users Joined AmiEXPO, The Amiga Event in New York and Los Angeles

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The user must specify a length for each field. This is not the usual limit that governs the size of the data stored in the field; it is the character length of the on-screen prompt for the field. Acquisition has the interesting property of dynamic-sized fields that grow as needed. I hesitate to call this a feature, because although it may reduce disk storage space, I expect it to slow down certain database operations. From a programmer's point of view, data structures with fixed lengths are, on the whole, much simpler and faster to work with. Most of the time it is much quicker to move to the *n*th position in a file or string than have to search for the character indicating the end of a field.

Finally, the user must designate one of the fields in the database as the system index, or key field. This field will determine the sort order of the records stored in the database. The information entered into this field should be unique to that database.

Once all this information is given, the database definition can be saved to disk. Acquisition 1.3F saves its data entry screens in IFF file format. The manual encourages you to edit them in your favorite graphics program (such as Deluxe Paint). Though the manual never mentions it, I had the best success editing the screens using medium resolution mode in DPaint II. I find this capability virtually useless. It is possible to make data entry screens works of art (one of the sample applications on the EXTRA disk for checkbook management enters data into a picture of a check), but I have a hard time believing professional database users would appreciate the gimmick. In all my years of database management, not one client or employer has approached me, sighed, and said "If only my checkbook application could look like a checkbook." Perhaps the casual home user might find this capability amusing, but Acquisition's hefty price tag probably discourages those customers.

Before we leave Creating, note that this module is also used to delete or add new fields from the field definitions of pre-existing databases at any time. This very useful capability, found in all the professional databases, allows the user to expand or contract his database as the situation demands. Acquisition lacks the ability of other database managers to change a pre-existing field from one type to another.

Bridge Over Troubled Waters

The next module that comes into play with Acquisition is Bridging. This module specifies the relational links between databases. It may also be used to specify the Acquisition version of a database index.

Acquisition operates using a path analogy. To access data in a database, you follow along a "path" leading to the index file upon which the data is to be sorted. Recall that in Creating, we were forced to designate one field as the system index. The data in this field was restricted to unique values only. It is through this field that Acquisition creates its first path, called the master system path, to the database. The user may create other paths into the database using the Bridging module to access data sorted on a different field than the system index field. The other non-master paths may be assigned to fields whose contents will not be unique.

One way to better understand this system is to create a more elaborate (and more bizarre) analogy: envision yourself as the cleanup person for the movie "The Blob," armed with a vacuum cleaner. The direction (read "index field") from which you probe the blob (read "database") with your vacuum cleaner (read "path") determines the order in which each part of the blob (read "data") is accessed. A path acts as an index file for a database. It seems that analogy for the simple concept of an index on a database is an convoluted hassle, until you learn to lump it.

The second use for a path is a bit more natural. Acquisition uses "relational paths" to specify connections between two databases. In this context, one of the related databases is designated the "parent" database, the other is called a "child." A relational path is followed from the index field of the parent to the same field of the child database. Acquisition allows the records of the child to be accessed several different ways.

Acquisition makes creating paths easy. A simple screen is presented, allowing the user to fill in the database name and index field for system paths, or parent, child, child access order, and index field for relational paths. Paths may also be edited to a certain extent using this module.

Watercolors

The last step in the genesis of a new database system is the Pasting module. This module is used to control the final appearance of the data entry screens and their interaction with the user. The user may re-size the length of the screen prompts listed under "field length" in the Creating module. Each field may be designated as display only for data entry. In addition, each field can have a stream executed or a phrase spoken by the Amiga's built-in speech synthesizer each time it is accessed. This module also allows for creating Acquisition macros. Streams and macros are discussed in a later section.

Sections of the screen can be moved or copied to re-shuffle the order of the prompts on the screen, as defined in Creating. A curious feature (and I use the term "feature" hesitantly) of Acquisition is that when the return key is pressed, the default movement of the cursor from one field to the next, follows the order listed in Creating's field definition table. This means it is possible to have the cursor jump around the screen, instead of moving to the nearest field in a logical manner during data entry. This effect could be rather disconcerting to the person entering data. There is a special menu entry to re-order the prompt sequence, but I find the whole idea distasteful. I don't believe the user should have to worry about the order of fields in his database definitions; the screen handling routines should be more intelligent.

Pasting also allows the user to draw lines, boxes, and ovals in different styles on the data entry screen. Since this function is probably best handled by an IFF graphics editor, I consider its inclusion redundant. Several styles of text may also be placed on the screen. Acquisition has no support for different fonts, but the graphics editor can be used to beautify the data entry screen and make up for this defect.

Push Push

Now that the database has been created, bridged, and beautified, actual database management can begin. This is performed by the Filing module. Filing handles all the on-screen data entry and retrieval functions.

Data entry in Acquisition, especially for multiple databases, is a cumbersome combination of keystrokes and mouse movements that I did not feel comfortable with even after extended use. Speedy data entry is bound to be handicapped by the effort required. Most of my qualms with the data entry screen handling routines have already been aired, but I would like to add to that list poor cursor key handling. If the screen is in a multi-column format, all of the fields in the current column must be passed through before the editing cursor returns to the top of the next column.

An important part of any database manager is its search capabilities. Acquisition 1.3F does provide a decent search facility that allows the use of boolean searches (using search criteria that is connected by AND's and OR's). An example of a boolean search would be "(salary > 10000) AND (state <> "RI")" to find all the records for employees outside Rhode Island who make more than $10,000 a year. All search criteria is case-sensitive, which can sometimes be a hassle. Acquisition 1.3F also allows the user to apply this search criteria to its get next/last, save, and kill record functions. It will not allow the function to complete if the data does not match the criteria. This is definitely a useful feature I have never seen in other programs before.

There are several other miscellaneous functions present in the Filing module. These include control of stream execution, automatic display of IFF pictures, and the ability to save child database records when the parent record is saved.

Acquisition 1.3F also performs record caching; it stores a group of records in memory before saving them in one batch. This speeds up the operation of the database, since the user is not forced to wait for disk I/O to finish before entering another record. An option controls the number of records to be cached and the amount of memory to devote to this task.

Let It Flow

Once the data is entered into the database, the Reporting module allows the user to display the information on screen or paper. Acquisition allows the user to manipulate and organize the data in several ways. The reports generated can contain the results of formulas based on the fields of the database. Summary information can also be produced.

Acquisition 1.3F has a very interesting way of building report specifications. A text file is created either in the minimal built-in text editor, or in the user's favorite text editor, as the manual recommends. Ordinarily, I would consider it a hassle to invoke another program to do the editing, but the Amiga's multi-tasking makes it virtually painless, since both Acquisition and the editor can run simultaneously. The report specification text file contains a description of the text of the title, header, footer, and page placement of the fields or formula results to be printed. It is usually a good idea to have a list of all the fields in a database since their exact names will be needed for the report specification. Reporting also allows the user to enter criteria to select a group of records from the database to be printed. Acquisition provides the option of sorting the data in a number of ways.

Designing reports in Acquisition 1.3F becomes more difficult for relational databases. In this case, the paths connecting multiple databases are important. When printing a report, Reporting performs what the manual calls a trace. A trace is simply the paths that the report program follows through databases as it prints the report. The manner in which a trace operates is called a depth-first search. This means that the trace will consider a record from the parent database, then all the records in its first child, then all the records in its second child, and so on. The second record of the parent database will not be considered until all the pertinent records of the child databases have been considered. Reports can be made very sophisticated by the inclusion of ACOM commands (discussed later).

Inside Moves

The last official module is Settings. This allows the user to perform miscellaneous utilities and to configure the Acquisition 1.3F system. The external data import/export function is located here. Unfortunately, Acquisition has no direct support for the import or export of records in stored in other database programs' file formats. The user is forced to use the "export to ASCII file" feature of the other database to create a file that Acquisition can read. Settings also allows you to report on or delete various Acquisition objects such as reports, paths, and databases.

(continued)

Generally, when records are deleted from a database, they are flagged by the database program as deleted, but the actual data is not purged from the file to save time. As a result, most databases have a separate function to perform the actual purging and reclamation of wasted disk space. In Settings, the user can tell Acquisition to perform the housekeeping functions (as they are called in Acquisition) automatically, on a daily or weekly basis. The user can even choose the day of the week preferred for this task. I consider this level of automation a definite plus.

Extensions

There remains only one more facet of the Acquisition program to be discussed: the ACOM command language. The command language with a database manager for automation. In most cases, a program written in a command language can manipulate the database manager as if there were a phantom user sitting at the keyboard. The ACOM language is made up of three types of commands. The first type consists of the basic constructs: assignment, arithmetic, looping, and input/output, commands found in any language. The second type of command is database specific; this includes commands to extract information from fields, convert fields from one type to another, and manipulate databases and records. The third type consists of Amiga-specific commands. These include commands to pop up autorequestors and display IFF graphics files.

I commend the designers on the extent and completeness of the ACOM language. It is full-featured, with over two hundred commands and real language constructs. However, note that the development environment is a bit shabby. There is only a minimal text editor and a trace function for assistance. I suspect any serious programmer would use his or her own favorite editor for both the Reporting module and program development.

There are three basic uses for ACOM. The first is for the mysterious streams I have mentioned before. A stream is simply a set of ACOM commands (255 characters in length or less) executed whenever a field is accessed. There are menu options in Filing that determine the exact events that trigger stream execution.

One use for streams is input verification and normalization. An example of this would be a phone number field in which the application designer wanted to make sure the user entered a value of proper length. If the user neglected to include an area code, the value of that field could be altered so a default area code is tacked on to the front of the entry.

The second use for ACOM is for macros. This term is used for a set of ACOM commands that are executed by clicking on a macro icon. Macros are useful for infrequently performed operations. A good example is a routine that sums up the values of a field in a database and displays the results on command.

The third use for ACOM is full-blown application programming. For most serious applications, program code is usually written to guide the user through the different aspects of the application and to perform automatic database/record manipulation.

Footsteps in the Dark

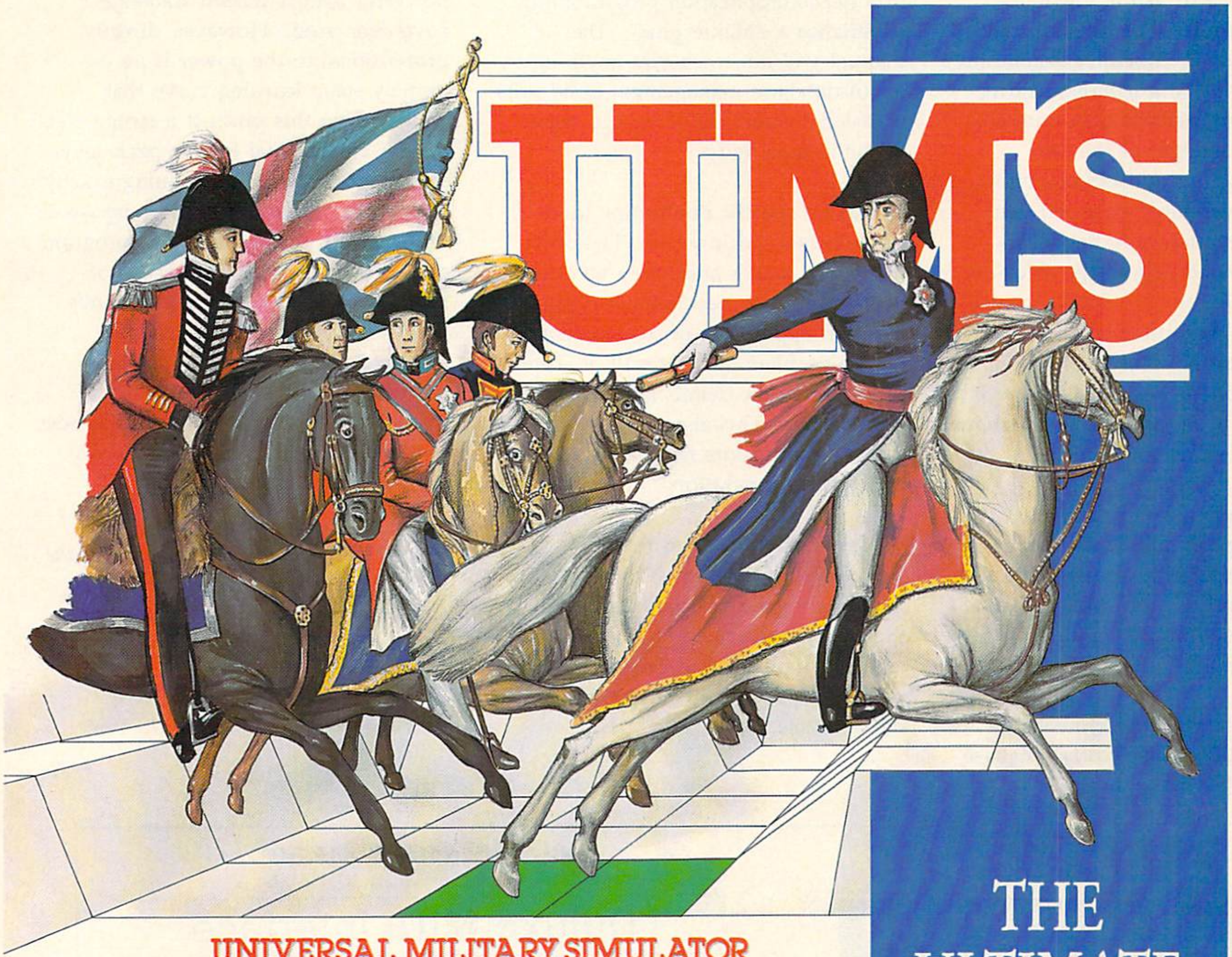
To begin my final assessment of Acquisition 1.3F, I must discuss the manual. With a program of this size, complexity, and cost, it is crucial to have good, organized documentation. The thick manual that accompanies the program is severely lacking in organization and examples. There is one very brief walkthrough of the program at the beginning of the manual, but the rest is devoted to reference.

Even the walkthrough did not always take time to explain the rationale for certain actions, or to define a term clearly. A good example of this is its instruction to "click on the NUMERIC icon" without indicating exactly which icon was the "NUMERIC" one. A few moments' study of the screen in front of me solved the problem, but it never should have occurred. Previous knowledge of a program should never be assumed in a beginning tutorial.

The biggest chuckle in the manual is at the end of the walkthrough: "If this tutorial has not answered all of your questions, please refer to the appropriate section in the reference text for a more complete explanation." My burning philosophical questions aside, I found the tutorial answered only a pitiful few of my Acquisition questions. Instead, it sparked off an avalanche of new questions that forced me to wade through the manual time and time again. The programs on the EXTRA disk provided the only set of really helpful examples to be found in the package.

Ordinarily, bad documentation would cause me to declare a program unfit for use, but there are points in Acquisition's favor that made me reconsider. First off, I believe that Acquisition is the most powerful Amiga database on the market. The emphasis is on the word "Amiga" since it is obvious this is a pure-bred Amiga product, and has not been freshly ported from another computer. It is obvious that the developers took great pains to customize Acquisition to the machine. In some cases, this works well. The storage of IFF graphic and sound files appears to me a useful extension of current microcomputer technology. However, there were times when I questioned the appropriateness of an icon-based interface to database operation. Some features, such as the ability to use a IFF graphics editor to customize the data entry screen, were superfluous to the point of distraction.

(continued on page 32)



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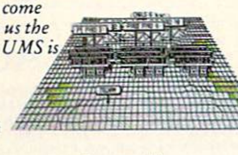
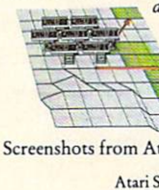
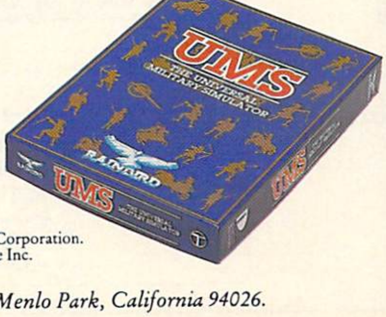




Screenshots from Atari ST.



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THE ULTIMATE MILITARY SIMULATOR

Intergalactic Development Incorporated

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My final evaluation of this product? I tried very hard to like it, but there were two stumbling blocks along the way that made it difficult. Despite my familiarity with both icon-based user interfaces and database environments, Acquisition's merger of the two seemed to require unnecessary effort to operate, even after extended use. The documentation only helped to change my mood ring to the color of frustration. At times, I felt I had just been handed an atomic bomb without instructions on how to bang the plutonium spheres together. There is great power in the system, but without guidance, it is useless.

The program is also not bug-free. Despite my great faith in the healing powers of meditation, the two visits I received from the guru during normal database operation did nothing for my peace of mind.

I would (hesitantly) recommend the purchase of this rather costly database only to people who:

1) Have had previous database experience (application programming experience a definite plus). The manual will not teach you anything about database management besides its occasional direct connection to stress in the human body.

2) Have a specific application (and implementation) in mind. The documentation makes absolutely no attempt to help the user decide how to implement an application or overcome a design problem. As a result, it seems best to have the details already worked out. This also prepares the user to spend more time on translation and less on frustration.

3) Have a definite need for the program's inherent power. Necessity is the only good reason I can see for the struggle the steep learning curve entails. If you need to catalog IFF pictures or sounds, then this may be the database for you.

As I mentioned before, this is the most powerful Amiga-specific database I have ever used. However, directly proportional to the power is an extremely steep learning curve that makes using this product a struggle at times. The manual for the package is a source of frustration, running exactly counter to my notion of the purpose of program documentation. The program could no doubt fulfill the needs of brave souls who need the program's power now, but unless they are prepared to dance the masochism tango (apologies to Tom Lehrer), I would recommend waiting for the next upgrade or turning to another program.

(A brief note on the subject of music: all the section headings for this article have been taken from record album titles. Some are rather obscure. Can you name the artist responsible for each?)

•AC•

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BUTCHER 2.0

by Gerald Hull

A Fascinating Collection of Image Processing Utilities

First Encounters

Nearly a year ago I purchased Butcher. I bought it on impulse, something I rarely do. However, it concerned graphics, in which I have an abiding interest, and was quite inexpensive.

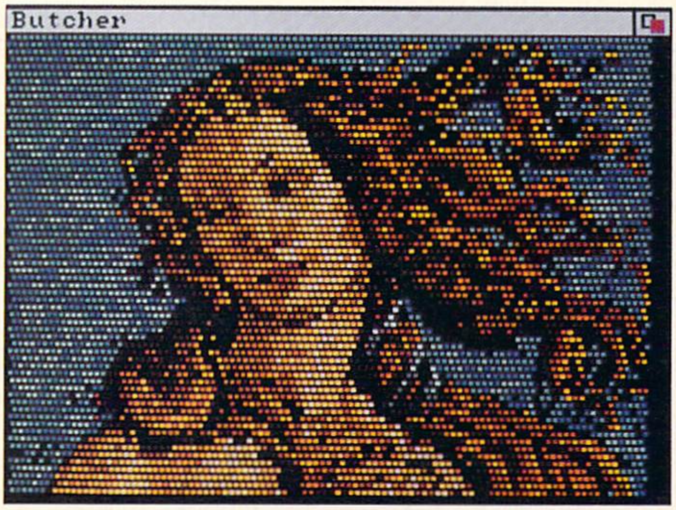
The first thing that struck me was the elegant simplicity of the packaging. Inside some shrinkwrap was a 32+ page booklet made out of 8 1/2 x 11 paper folded down the middle and stapled. A plastic disk envelope, taped to a booklet-sized piece of cardboard, held the disk to keep it from sliding out.

That was it. A most attractive display of minimalism. (Version 2.0 comes in a much more "professional-looking" package.) However, if that was the extent of Eagle Tree's ingenuity, I probably would not be writing this review.

Fortunately for all of us, the same cleverness characterizes the software as well. I find Butcher an extraordinarily useful and well-designed program—a fascinating collection of utilities that provide an indispensable adjunct to my other imaging software. It's the Swiss Army knife of Amiga graphics.

The Principle of Complimenarity

Butcher is not intended for creating images, but for manipulating, enhancing, and "abusing" images derived from other sources, such as drawing programs like DeluxePaint, or frame-grabbers like Digi-View. As the manual puts it, "Butcher is designed to complement programs that support the IFF standard."



I first used Butcher to convert images from one resolution to another. I had hi-res/interlaced images from Digi-View that I wanted to convert to lo-res/non-lace, and lo-res/non-lace images that I wanted to make hi-res/non-lace for letterhead I was designing. (I followed the Butcher manual in using "low" and "high" to discriminate between 320 and 640 pixel widths, and "interlaced" to distinguish 400 from 200 pixel height images.)

Most Amiga programs dealing with graphics require you to specify the resolution right from the start, and they don't always allow you to change it on the fly. Butcher, on the contrary, automatically changes resolution to accommodate the image being loaded, taking advantage of the IFF standard's "data-gram" component.

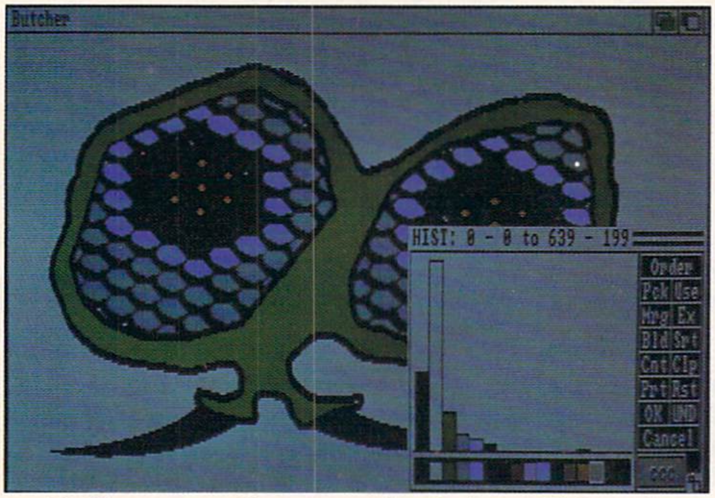
Butcher made my resolution transformations easily and quickly. Given my needs at the time, that was enough to warrant purchasing the program, and for some time, that's about all I used it for. However, I started work on an Amiga project involving a special kind of image processing. Much to my delight, I discovered that Butcher contained a repertoire of features which could do the pixel-by-pixel operations required by my project.

Eagle Tree's release of the 2.0 Butcher upgrade has given me an excellent opportunity to explore all its other dimensions. As you will see, I have discovered many more cleverly designed, useful tools folded away in the program's menus.

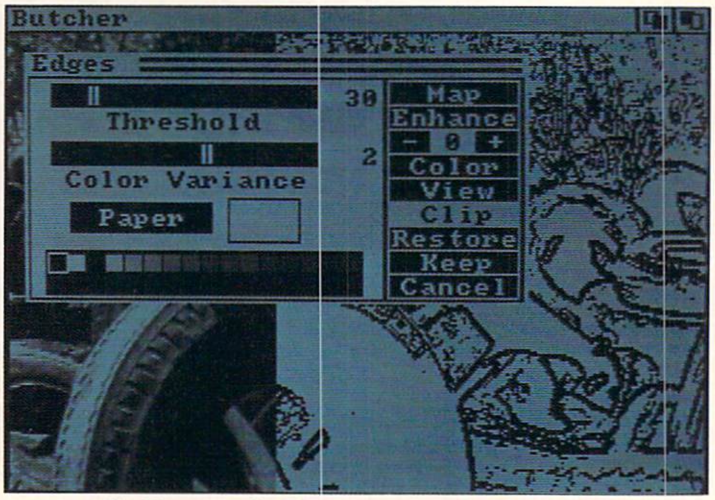
Riding the Bit-Planes

Before getting into details of the program, let me describe some of the special characteristics of Amiga graphics. Most comparable micros "hardwire" a particular memory area to serve as the screen display. This simplifies hardware, but imposes limitations on graphics capabilities.

(continued)



The Edge requester allows you to select the degree of "edginess" you want to detect.



The Histogram function constructs a bar chart showing the frequency of each color's use.

Some computers, for instance, can reach their higher resolutions only by severely reducing the number of displayable colors. Their highest res may only be monochrome. The Amiga, by contrast, is wonderfully flexible in its treatment of screen memory.

The first 512K of system memory in the Amiga is called "CHIP" memory. It is the area accessible by the special Amiga chips responsible for graphics (and much more). Any continuous segment of memory in this region can function as a "bitplane."

The bits in a bitplane correspond one-to-one with the elementary picture elements ("pixels") which make up the screen display. Different-sized bitplanes result in different-sized screens. For example, 8000 bytes are enough for lo-res/non-lace; for hi-res/interlace, 32000 bytes are needed.

By stacking up these bitplanes, you enlarge the number of bits per pixel available for specifying a color. With four bitplanes, for instance, you can index into a table of 2 x 2 x 2 x 2 = 16 different color registers. Each such register uses three four-bit segments to specify the red, green, and blue components of each color. Sixteen possible values for each (binary 0000 to 1111), multiplied by three segments, produce the Amiga's 4096 colors.

With lo-res width images (320 pixels), the Amiga allows as many as five bitplanes for the display, which enables a total of 2**5 = 32 colors on screen simultaneously. For hi-res widths (640), the hardware can accommodate only four bitplanes. However, if you stick to the lower res, the Amiga also features a special "hold and modify" (HAM) mode which uses six bitplanes to permit all 4096 colors on screen at once.

Two of the six bitplanes are used to select one of four modes for each displayed pixel. In mode zero, the pixel color is determined by the color register value indexed by the other four bitplanes. But in modes one, two, or three, those bitplanes are interpreted as providing just blue, red, or green value, with the rest of the color "held over" from the previous pixel.

It Slices, It Dices

Those two components of the Amiga screen display—a set of bitplanes on one hand, and a sequence of color registers on the other—provide the basic ingredients for Butcher's assorted forms of image manipulation. Let's take a big breath and try to go through as many features as possible.

Some of Butcher's operations act on all the bitplanes of the image at once. As we have seen, you can transform an image from any resolution to any other. You also can go from HAM to lo-res/non-lace, and back. The Reverse utility changes the image's orientation from right to left. Flip turns it upside down.

If you select Format, you can display any image in a screen of any other resolution (as contrasted with changing it to that resolution). For instance, you can view a hi-res image in a lo-res screen. Since not all of it will be visible at once, you can scroll using the cursor keys. In Format and elsewhere, Butcher makes appropriate provisions for overscan images.

You can use the Change Depth feature to add or delete bitplanes within the constraints of the Amiga hardware. Or, you can use Slice Plane to display any subset of your image's bitplanes, which creates many interesting effects.

If you load in a Spare image, a number of other tricks becomes available. For instance, you can swap bitplanes between your main and spare images. Or, you can select one particular color, and Merge the spare into the main picture everywhere that color is or everywhere it isn't.

Here, as with most of Butcher's transformations, extensive use of the Amiga's special blitter chip speeds up the operation. Usually, it is done in less than a second. In most cases, the program allows you to Clip a rectangular subsection of the image. As long as such an area is defined, Butcher restricts its transformations to that region, speeding it up even more.

It Makes Julienne Fries

As the Merge functions show, Butcher can transform the contents of your images' bitplanes in addition to shuffling them around. It provides a Draw menu with many of the basic functions you'd expect: straight and freeform lines, solid and outlined rectangles and ellipses, generalized polygons, fills, airbrush, and so forth.

The program assumes you have access to more powerful tools of this sort elsewhere. More unusual is Butcher's ability to make pixel-by-pixel transformations depending on the color register value addressed by that pixel. (For this reason, most of the program's operations cannot be performed directly on HAM images.)

Foremost is its edge-finding capability. Butcher uses a Sobel operator for "edging." The color of each pixel is compared to that of its immediate neighbors. If the difference in color exceeds a threshold, that pixel is highlighted as part of an edge.

The program uses a color's intensity for these comparisons, which it calculates as the simple sum of the red, green and blue segments of the color register value. There are other ways of calculating intensity; color is a mysterious thing. Butcher's approach is adequate for most purposes.

The Edge requester allows you to select the degree of "edginess" you want to detect, and the pen and paper colors for drawing it. You can even write the edge directly on the image. Beside creating nice effects, it provides a chance to experiment with one of the fundamental techniques in the artificial intelligence analysis of images.

Butcher doesn't use the blitter for edge-detection, however, and takes nearly 30 seconds to "edge-ucate" a 320 x 200 pixel screen. This represents an almost threefold speed-up over the first version of the program.

You are also given flexibility in the Filter utility, which allows isolated groups of pixels of different sizes and colors to be deleted. A Screen command provides the ability to do something called "sample ordered dithering," and Diffusion provides one of many variations on half-toning.

One of Butcher's most powerful tools produces what are called Mosaics. In the simplest version, it subdivides the image into squares of four pixels, and shades each square with one of the original colors. The result is a "tiled" effect, as the image is reduced to one-quarter of its original resolution.

Butcher 2.0 takes this concept much further. You are given the ability to design whatever size and shape tile you desire, overlapping or separated. Indeed, you really can do "julienned" strips in a late-night paroxysm of image processing madness.

Make Me A Palette

So far, we have concentrated on operations which alter an image's bitplanes. Now let's look at Butcher's many tools for manipulating the color register table. The most important is the Make Palette requester. ("Palette" is Butcher's term for a particular set of color table values.)

Butcher maintains two palettes in addition to the one loaded with your image. This allows you to save a copy of the original in case you become unhappy with your changes. Any of the colors in the image can be selected by clicking on samples in the requester, or on a pixel of the appropriate color in the image.

Sliders control changes in the red, green and blue components of a color. Butcher also breaks color down into hue, saturation, and value components, which you can change as well. "Hue" refers to a color's position in the spectrum, which Butcher represents as a point on a color wheel. "Saturation" represents the vividness of the color, and "value" its degree of lightness.

There are tools for changing the whole palette. These alter the red, green, blue, saturation, value, or contrast of all colors in the palette simultaneously.

There's even more. Clicking on Neg or Cmp inverts a color value in different ways. Pck causes all the pixels in the image of a selected color to flash in red, which is often useful. A toggle switch brings up a selection of color cycling tools, permitting four ranges, each at a separate speed.

Perhaps the most powerful function on the Palette requester is the ability to sort the color table according to intensities. The image does not change, because after Butcher rewrites the pixels for each color, it makes sure the new color register they index has the proper value.

And That's Not All

If you would rather sort the palette according to the frequency with which each color is used, use the Histogram function. This tool constructs a bar chart showing the frequency of each color's use. A click of the mouse button replaces the bar chart with a line graph capable of showing the red, green, blue, hue, saturation, and intensity histograms of the image (or a subsection, if you're using Clip).

You can rewrite all the pixels of a given color in other ways. Butcher lets you Exchange, Merge, and Blend different specific colors. If you want, you can direct the program to print the color statistics and graphs that Histogram generates. This information is very useful for segmenting an image, another artificial intelligence technique. Density Slice lets you highlight up to four of these segments.

Butcher provides a host of other operations for manipulating the values in the color registers. You can render your image in black-and-white, or Tone it with the hue and saturation of your choice. You can Negate or Complement the whole palette at once. There are controls for False Colors, Pseudo Colors, and Antiqueing.

With Segment Color you can restrict the colors displayed to a specific range around a particular hue, saturation, and value. Band enables you to represent the red, green, and blue components of your picture as intensities of gray. If you have a laser printer, or want to make a T-shirt from an image, Butcher provides all you need for color separations.

Some of Butcher's other useful features include the ability to print out Clips, as well as the whole image (either as is or expanded); an extensive use of keyboard commands to parrot or augment the mouse; and a number of memory conserving options for those with limited RAM. The program also lets you check on how much memory is available, a nice touch.

Order Now, While Supplies Last

There are many more features I could discuss, but a litany of this kind can only go on for so long. If I've managed to create the impression that the program provides a rich grab-bag of image manipulation tools and techniques, then I'm satisfied.

The program is amazingly inexpensive for what it does, and can be upgraded for not much more than the cost of a disk, shipping and handling. I find it heartening, in these mercenary times, that some people can still provide a quality product at a reasonable price.

There are things I would do differently. I suspect the tools could be more clearly organized. And although the new booklet has been greatly expanded, I would appreciate a more detailed discussion of the color concepts underlying its features.

Instead of representing each hue as a point on an imaginary color wheel, it would be nice if Butcher actually showed that wheel on the screen, or better yet, a color solid. This would help users get a more intuitive grasp of the web of color they are transforming in their images.

There are the inevitable inconveniences and bugs. Butcher has the kind of Undo feature you would expect, but it is often needlessly "no-opted" by selections irrelevant to the image. When moving from one resolution or format to another, you will lose the spare image without warning. And repeated use of the Format controls can cause the program to "lose" memory, leading me once to Mr. Guru.

As the manual points out, many of the features of Butcher 2.0 have resulted from comments and suggestions prompted by the original program. I can only hope that this process goes on. If you have any interest in Amiga graphics, you should get Butcher. This consumer reports a "Best Buy."

Spec Talk

Butcher 2.0 requires Kickstart 1.2 and an Amiga with 512K of memory. The package contains a single, bootable disk with the program and some sample images, plus a 57-page instruction manual. The disk is not copy protected. The list price is $37.00; owners of version 1.0 can upgrade for $10.00. Butcher is written by Jerrell Nickerson and released by Eagle Tree Software, P.O. Box 164, Hopewell, VA 23860 (604) 452-0623.

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About The Author

Gerald Hull is the president of Creative Focus, a software consulting firm located in Binghamton, New York. He has a largely irrelevant doctorate in Philosophy, a confusing sense of humor, and a dog named Louie. PeopleLink: DRJERRY, BIX: ghull.

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- Commodore Magazine

"....an extremely well-written, well-debugged, and well documented program"
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by John Steiner

Bug Bytes

The Bugs & Upgrades Column

In AC V3.3, I reported on a bug and an upgrade policy for Deluxe Paint II. I have since received a communication from Charlotte Taylor of Electronic Arts regarding the information I provided. In her letter, she comments on that report.

1. The article implies that disks that have the DH: button (as opposed to those that have a DH0: button) will crash the hard disk. Their quality control department wants to assure readers that those disks are functioning properly.

2. Electronic Arts will replace any problem disk, regardless of the problem, free of charge within the first 90 days of purchase (a copy of the dat# receipt must accompany the request). After 90 days, Electronic Arts will replace the disk for a charge of $7.50.

3. If readers have any question about the status of their DPaint II disks, they should contact customer service at (415) 571-7171.

Regarding the first item, the original bug report was included in my column because I received three separate reports from three different individuals. The second item is a matter of Electronic Arts policy. Either my original source was incorrect on that upgrade policy, as earlier reported, or the policy was deviated from in that instance.

I received a letter from Geary Boulrice of San Diego, California, who wants to pass along to readers information regarding undocumented options available to Sculpt 3D users. 1. Click on the DOWN tri-view window. 2. Press CTRL-D3. A MAGIC NUMBI? requester will appear. Enter the numbers 123 without commas or spaces and click OK. (These numbers work with version 1.1x only; he hasn't figured out the numbers for the 1.wx version.)

Enabling the OBSERVER menu and its MODE submenu will show new options to lock and unlock your color palette. Also, enabling the EXPOSURE submenu will reveal LOCK and UNLOCK options, both of which are initially set to UNLOCK.

James Mitchell of Kailua, Hawaii wrote of a couple of bugs he has found in AmigaBASIC. Mr. Mitchell spent a long time finding a problem that invariably crashed the system. When a comma was omitted from a set of data statements that were subsequently fed into a screen graphics PUT command, it was off to see the Guru.

If a block IF-THEN-ELSE structure is used in the confines of a SUB program, a SUB WITHOUT END SUB error is generated. If the block IF-THEN-ELSE is changed to a single-line IF-THEN-ELSE, the error is no longer generated. See V3.2, page 63, listing 4 SUBprogramLOADFONT for a case in point.

Shakespeare is a new desktop publishing program for the Amiga. Its ability to do color publishing is unequaled. However, according to reports found on information services, the program has some rough edges. Loading a font without text on in the frame will cause a guru error. The default font doesn't always change when selected via the requesters. There also seems to be a problem with fonts larger than 20 points remaining active for more than a few letters. Several users have reported that document size must be set to 8 by 11, rather than the default size of 8.5 by 11. If the smaller size is not selected, the program will guru.

Professional Page, Gold Disk's top-of-the-line desktop publishing software, has a problem with some defaults. Among other default items, the default box function does not seem to work right. To work around this problem, put a box on the pasteboard, set all its default characteristics, and use "clone box" to create a box with the correct attributes each time you need a new box. You will have to resize the new box as required, but it is easier making major changes in the box after using the Create box function, which uses the default box attributes. If you have tabs set in the box, this work-around is especially useful. The technique can be extended to several different box types, which can be stored on the pasteboard. When a new box is needed, just clone the box of the desired type.

According to information found on a GEnie posting by an Amiga user, Softwood File II (also known under the name MiAmiga File II) has a bug in the PAGE SETUP submenu of the PRINT menu. At the requester that lets you specify print environment options for printing labels, there are OK and CANCEL gadgets. Neither gadget seems to work properly under some conditions. Both gadgets do work, but only on the very right of the OK gadget, and the extreme left of the CANCEL gadget.

Many people have been complaining about the Amiga 2000 clock gaining or losing time (mostly gaining). It seems that quality control may have slipped up, and let a batch go out without having clocks set to keep time accurately. If your A2000 gains or loses time, you can adjust the clock yourself, though it takes patience, and probably several attempts before it is right.

Take the cover off your A2000, and look for a small yellow square in the front center of the motherboard. Use a jeweler's-sized phillips screwdriver, and turn the screw counterclockwise inside the yellow square to slow the clock down. You will have to turn it in small increments and test it for accuracy. You can get close by using the digital onscreen clock while comparing it to a digital watch. When the seconds click by seemingly in unison, you are getting close. It may take a few tries to set it exactly right. Reset the system date to the correct time and date when you're through adjusting the clock. Thanks to Frank, known also as Minotauron People Link, for this suggestion.

Amiga 1000 owners who are having intermittent problems loading Kickstart and/or Workbench may find the problem cured very simply. The Amiga goes through several diagnostic tests upon power-up. If the screen remains one color, and refuses to boot Kickstart or Workbench, this indicates a defect was detected by diagnostics. A RAM problem is usually indicated by a green screen. Though it is not always the problem, one solution to try before taking your Amiga to the service center is to reseat and check connections to the 256K RAM daughterboard that holds Kickstart software.

In many cases, Amiga 500s that have trouble booting Workbench can be repaired by simply reseating the Fat Agnes chip. One user has reported that Commodore has installed a hold-down assembly that keeps the chip solidly in place on the latest production of A500s.

Oxxi, Inc. has a bug fix for MaxiPlan Plus v1.8g, which will soon be sent to registered owners at no charge. Version 1.9 fixes problems with graphs. Owners of previous versions of MaxiPlan Plus should contact Oxxi technical support regarding the upgrade. They have several different rate schedules, depending upon which version you have.

Registered owners of Oxxi's Nimbus, a business accounting package, will soon be receiving a free upgrade to version 1.3. When the upgrade is ready, it will be mailed to users who have sent in their registration cards. All upgrades for Oxxi products are handled in this manner, and if you own Oxxi software, you should send in your registration card. You will get a newsletter that reports on Oxxi products and upgrades.

Oxxi, Inc., P.O. Box 4000, Fullerton, CA 92634 (213) 427-1227

Oxxi Inc., and Leon Fenkel, the developer of Benchmark Modula-2, have been in a court battle over rights for the marketing of the compiler and its associated products. The court battle is over, and Oxxi, Inc. will continue to market the original version.

The original developer and publisher of the software is currently marketing the program through Avant-Garde Software. According to a statement posted on People Link by Leon Fenkel, Avant-Garde will be marketing all future releases of Benchmark Modula-2. Avant-Garde Software is offering an upgrade for users who purchased the Oxxi version before March 1, 1988. The upgraded package includes the latest version of Modula-2, new documentation, technical support, compatibility with upcoming add-on products, and an upgrade path for future enhancements and new versions.

The prices for the upgrades are: $99 Benchmark Modula-2, $49 Simplified Amiga Library, $49 IFF and Imle Resource Library, $49 "C" Language Library

One or more of the above items may be upgraded. The prices include shipping inside the U.S. For Canada add $10 to cover shipping. Outside North America call for shipping cost.

To apply for the upgrade, send the original purchase receipt (keep a photocopy for yourself), a money order or check, and your address and telephone number to: Attn: BETA Upgrade Offer Avant-Garde Software 2213 Woodburn Plano, Texas 75075 (214) 964-0260.

MicroSearch has announced an upgrade for its desktop publishing program, City Desk. An item in their March, 1988 newsletter announced the release of City Desk 2.0 at the Spring COMDEX computer trade show. There were no details about improvements, but the upgrade cost is $35.00. The notice also stated that the user would need to return the original disk, manual, and box.

In the same newsletter, MicroSearch announced an upgrade to the Head Coach game. Version 1.1 has new features, including stronger run defenses, expanded player ability input, auto printout of stats by quarter, down and yard markers, and view player stats.

To receive the upgrade, send $6.50 and your original diskette to: Head Coach V1.1 Offer, MicroSearch, 9896 Southwest Freeway, Houston, TX 77074 (713) 988-2818. Allow two weeks for delivery of the update.

•AC•

AmigaNotes

by Rick Rae CIS 76703,4253

The Amiga seems to be moving into the third phase of its musical growth curve. In the first phase, we had composition programs like Music Studio, DMCS, and Sonix—programs allowing you to create music on the computer and play it back via internal sounds and external MIDI instruments. Phase two brought us real-time MIDI recording with packages like SoundScape Pro MIDI Studio, Dr. T's KCS, Dynamic Studio and Music-X. Granted, there has been some overlap of these two phases, but the trend has been toward more and more capability.

Now, we're starting a new chapter. The Amiga has been provided with a reasonable number of programs directly involved in composition and performance, and manufacturers are now turning to support items like patch editors, patch librarians, sample editors, and sound creation tools. This month we'll take a look at one of these new tools: a patch editor/librarian.

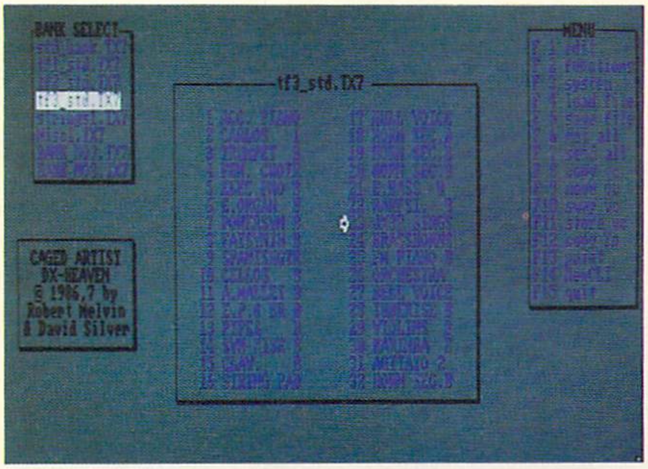


FIGURE ONE

Back in the days of modular analog synthesizers, you kept track of your patches with a notebook or an index card box. When a string sound was needed, you'd dig through your notes and use patch cords to connect the various modules together (hence the shorthand term "patch," meaning a sound setup) and tweek the knobs until you found what you wanted.

With the advent of programmable synthesizers, the need for written notes has gone. We can store patches in the synthesizer's memory or on removable cartridges. But if you're using a computer to control a network of MIDI synthesizers, it makes more sense to use the computer for patch storage. This is the function of a librarian—to store, catalog, and retrieve synthesizer patches using your computer's disk drives.

Along with the fancy new synthesizers came a reduction in the number of knobs to tweek. Many modern synthesizers have only two knobs—a master volume control, and what is often called a "data entry slider." Rows and rows of buttons select the function you wish to edit, the slider changes that value, and the results are shown in a small display window. Although this is great for cutting costs and improving reliability, it can make creating a new sound, or even editing an existing one, a real pain. The patch editor helps out by allowing you to do the editing with your computer, providing a much larger "window" into the synthesizer. A comprehensive patch editor might even provide graphic editing and features that the synthesizer itself doesn't even support.

DX-Heaven from Dr. T's

Lots of people are very excited about Dr. T's decision to support the Amiga, and for good reason. Dr. T's has been around for quite some time and supports the C64, C128, IBM PC, Apple II, Macintosh, and Atari ST. As with the release of WordPerfect for the Amiga, many feel that Dr. T's has helped "legitimize" the machine, which in turn will convince other companies to develop software and hardware for the Amiga. Of equal interest to those of us who must use the software is the fact that Dr. T's sells a quality product.

If you have a synthesizer, chances are that Dr. T's has a patch editor/librarian for you. They currently support over a dozen instruments, and more are added every day. I've just finished an in-depth investigation of DX-Heaven, developed by Caged Artist and distributed by Dr. T's. This

(continued)

is a fully functional patch editor/librarian for the Yamaha DX-7 and TX-7 synthesizers and TF1 modules. Since the niggly details would only be of interest to owners of these machines, we'll take a look at the general layout, which applies to all of Caged Artist's editors/librarians. Nearly all the comments I will make about DX-Heaven apply to the entire line.

First, the bad news. If you expect flashy or fancy graphics, you're going to be disappointed. DX-Heaven is a direct port from previous versions, and it shows. Pull-down menus are not supported at all, gadgets are for the most part hidden, and the graphics are minimal. Figure 1 is a typical DX-Heaven screen.

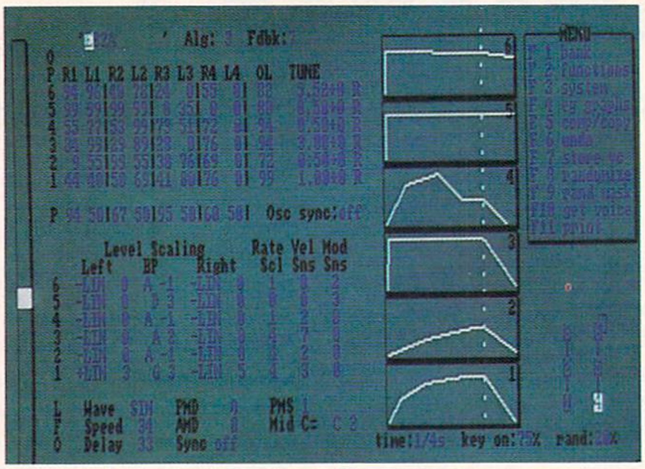


FIGURE TWO

Now for the good news. Since the Amiga version of DX-Heaven *is* a direct port, you'll feel right at home if you're already used to, say, the C64 version. It could be a great advantage for MIDI musicians moving up to the Amiga. The lack of pull-down menus makes sense because they simply aren't needed. And most importantly, DX-Heaven works, and works well.

The User Interface

One of the nicest things about DX-Heaven is it supports both the keyboard and mouse almost completely. If you're a mouse addict, you can do almost everything with the rodent. Each menu item is actually a hidden gadget, and you simply click on the name of the function to select it. A huge data slider (you can see it to the left of the screen in Figure 2) can be used to enter every parameter. (Even the individual letters of each patch name, if you're that much of a masochist.) The only thing requiring the keyboard is the file requester, and then only if you are saving a completely new patch bank to disk.

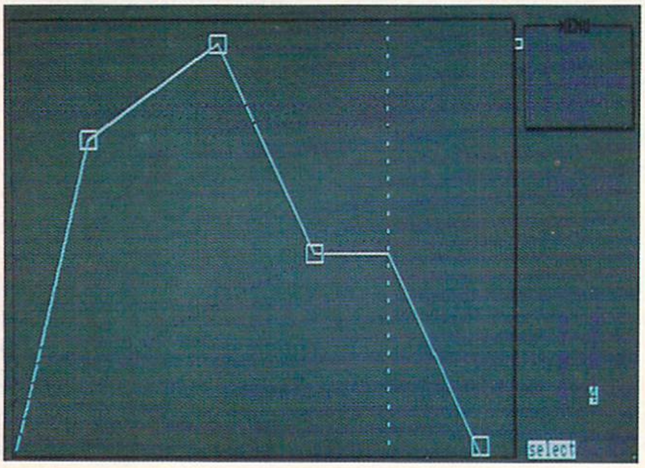


FIGURE THREE

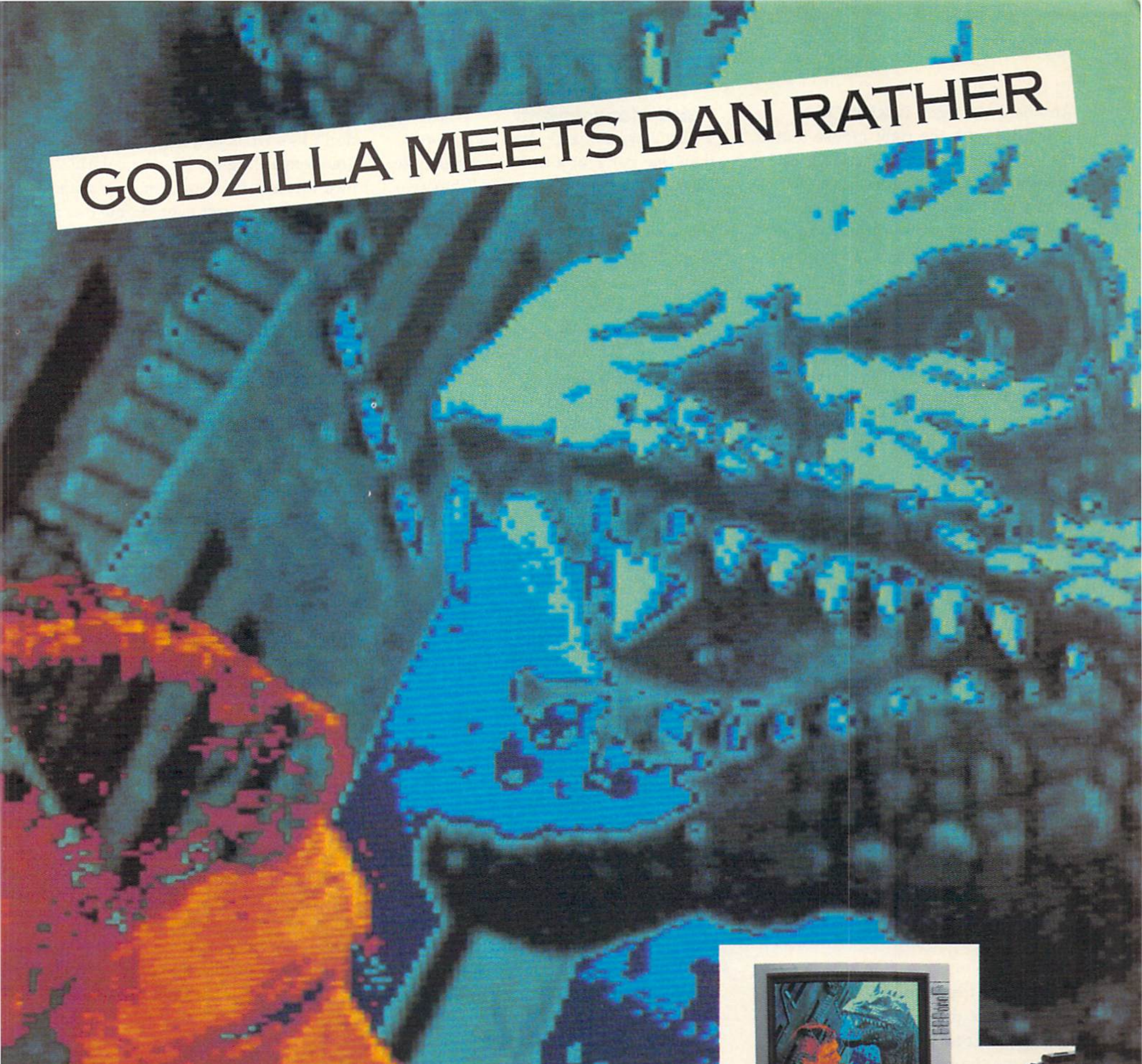
Conversely, if you have mouse-o-phobia, nearly everything can be done from the keyboard. All the menu functions are represented by function keys, and are clearly labeled on each screen. You can move around on the edit screens using the arrow keys, then enter new values directly for each parameter, or increment/decrement them using the keypad "." and "-" keys. About the only thing you can't do without the mouse is graphic envelope editing, although you can of course set the envelopes via numeric entry.

Using either input device all the time would be ludicrous. Rather, the beauty of this scheme is its flexibility; you can use whatever mix of mouse and keyboard *you* find most comfortable. I like the graphic envelope editing capabilities, and the direct access to all parameters by simply clicking on them. But I find it faster to key in completely new parameters from the keyboard, rather than slide the mouse around. You might like a different combination, but that's the point. DX-Heaven will accommodate you. A high score for flexibility in this area.

As long as we're talking data entry, I should mention that you don't have to specifically "grab" the data entry slider to move it. Instead, you can click a parameter and then, holding down the left mouse button, move the mouse vertically toward the slider's knob. As soon as the mouse is directly across from the knob, the knob will begin tracking the mouse, allowing you to make rapid changes in values without having to fiddle with the slider.

Figure 3 shows the graphic envelope editing screen; a similar screen is available on Caged Artist's patch editors for other synthesizers. The DX7 has one envelope for each of its six operators. The active envelope is shown with solid lines, with the other envelopes shown as dashed. The small boxes mark the endpoints of the waveform segments; you can grab these with the mouse and drag them wherever you want them (within the limits of the synthesizer, of course). This is an excellent approach for fast approximations of new sounds. Once you get close to the graphic editor, you can switch to the edit screen (Figure 2) and fine-tune each envelope parameter individually.

(continued on page 42)



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Another nice touch is what Caged Artist did with the right mouse button. As I mentioned earlier, there are no pull-down menus. Since the right button isn't needed for that, it is instead used as an "audition" button. Any time you click the right mouse button, the synthesizer you are programming plays a note. Moving the mouse to the right produces a higher note, to the left a lower one. Moving it toward the top of the screen produces a higher MIDI velocity (normally a louder or "brighter" tone), whereas moving towards the bottom produces a lower velocity. What's more, you can apply modulation by moving the mouse up and down on the screen with the left button depressed; this modulation can simulate any one of several controllers, such as the modulation wheel or aftertouch. Combined, these functions are useful for fine-tuning a voice. Instead of reaching over and playing the instrument keyboard, you can keep your hands on the mouse and computer keyboard, and your eyes on the screen.

I won't say anything else about patch editing, since the details would only apply to people who own six operator Yamaha synthesizers. Suffice it to say that the editing facilities are well-designed and easy (yes, even intuitive) to use.

The manual I received was the Atari version, since the release version wasn't quite ready. The folks at Dr. T's tell me the new manual will be ready by the time you read this. It will be a "split" booklet which covers both the Amiga and ST versions. I should have it by next issue's deadline; if that's the case I'll comment on it briefly. I do hope they don't "tone down" or "serious up" the manual; I rather like the conversational approach of this version. I was especially fond of some of the obvious hacker comments, such as "The DX format involves a serious kludge, a series of undocumented simulated button pushes, which does, however, seem to work..."

Patch Management

Today's synthesizers deal with more than one patch at a time, arranged into banks. For example, the DX-7 has two 32 patch banks, one in internal RAM and a second on a removable RAM or ROM cartridge. Arranging the 32 voices you need for tonight's jam or the band's first set can be a pain using the synthesizer alone; with DX-Heaven it's a joy. The program will load up to eight banks (256 voices) simultaneously. You can copy a voice from one position in any bank to any position in same or any other bank, move a voice from any position to another position within a bank, or exchange any two voices. A copy of a bank's patch list can be quickly dumped to the printer and carried to your practice session, so the group can verify the order of the songs, or so you can file your patch lists in a notebook (helpful if you have thousands and thousands of patches).

Other Goodies

As I mentioned in the opening, a really good editor/librarian will often provide you with features the synthesizer doesn't even support. In addition to voice storage on disk and graphic envelope editing, DX-Heaven will randomly create patches. These machine generated patches are a good start toward a new sound; DX-Heaven will sometimes try something you never would, and the result is an "oh, that's interesting..." sound, which you can then tweek to your satisfaction.

Since a totally random patch would in all probability be useless, DX-Heaven lets you specify what parameters you wish to randomize. The selections—from a single parameter to every one in the book—are totally up to you, and define what Caged Artist refers to as a "Randomization Mask." Once you've set up a mask (by clicking the "Rand Mask" gadget and all the parameters you want to randomize), simply clicking "randomize" will generate new random patches, one per click. It's very easy and fast. Click "randomize" and play the new sound using the right mouse button; if you don't like what you hear, click "randomize" again. A particularly nice touch is that you can save your masks to disk, and even define one as the default, so it loads automatically.

DX-Heaven also comes with over two dozen banks of patches for the DX/TX family (there are 32 patches per bank, so that's over 750 sounds). I have no doubt that the other librarians also include a similar treasure chest. On startup, DX-Heaven loads a blank patch bank called INITBANK.TX7 from the current directory; if you don't mind naming an actual bank this, you can have DX-Heaven come up loaded and ready to run with 32 of your favorite sounds.

In addition to its functions as a patch editor/librarian, DX-Heaven also pulls its MIDI weight in other ways. For example, the DX-7 can receive data on any channel, but can transmit only on channel one. DX-Heaven's "Rechannelize" option allows you to change *all* channel messages reaching the Amiga's MIDI IN port to the channel of your choice at the MIDI OUT port. "Solo" allows the channel voice messages for one selected channel through, blocking all others. These functions can come in particularly handy in a larger MIDI system, especially when you are playing manually or using a dedicated sequencer.

Gripes and Gotchas

DX-Heaven is protected with a key disk scheme, which means you can make working copies or move the program to your hard drive, as long as you don't mind plugging in the master copy once during startup. Sadly, if you click the cancel gadget of the disk requester or accidentally name your working copy the same as the master disk, DX-Heaven will promptly crash your machine. I suppose this approach is satisfactory for a C64, but it is extremely heavy-handed for a multitasking machine.

(continued on page 44)

HomeBuilders__CAD

Dear Mildred,

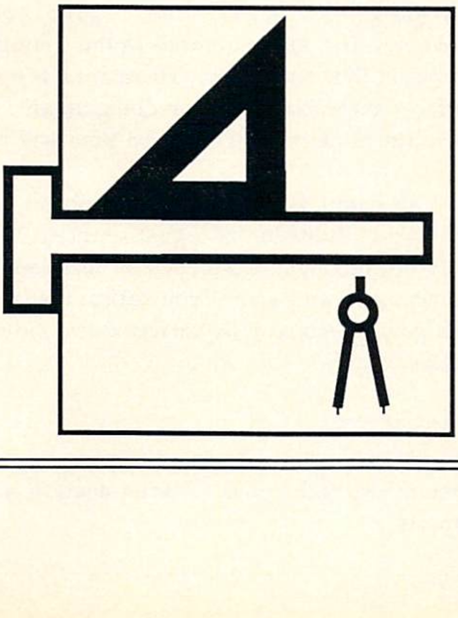
I'm writing this letter while alone in the living room. The rest of the family is down in the basement huddled around our Amiga computer designing the famous family room that never gets built. I'd be down there too, but you have to buy a ticket to get close enough to see the screen. They are using this program called **HomeBuildersCAD** that Bob bought this morning. For all his talking, he never got past the sketch on paper stage before now. Remember I told you about that drawing program he got last year that drove him crazy with all those lines he had to draw? Well, he is smiling now. He says all he has to do with **HomeBuildersCAD** is point to what he wants to draw and where he wants it. The program does the rest. It even draws steps and sinks and get this, a bidet!

I know I'm beginning to sound like a salesperson, but Bob says that what he likes best about **HomeBuildersCAD** is that it shows him a detailed estimate of what he draws. Now we know how much we don't have to spend. Grin.

You asked about Margaret in your last letter. She's fourteen now. I thought she was about to enter the prom dress stage, but she's downstairs fighting for computer time to design her spring term project for school. She has decided she wants to be an architect.

I'll send you multiple views of the family room design right off the printer. The next time you visit we will hide out in it. I'm sending you all Bob's stuff on **HomeBuildersCAD**. You are the computer literate one. I understand it so I know you will. It's about time you built that cabin at the lake, isn't it? By the way, the company's name is **EaseWare**. Get it?

See you soon, Whitney



Drop in on your local Amiga dealer and ask for a HomeBuilders Demo. If they don't have it, call EaseWare for the HomeBuilders__CAD dealer nearest you.

Suggested retail price
$199.00

EaseWare
25 Belair Road
Wellesley, MA 02181
617-237-2148

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The reason I know this is from a little glitch in the copy of DX-Heaven I received: several of the data file icons which can be used to start DX-Heaven want a disk named "DX HEAVEN", with a space. The disk is in fact named "DX-HEAVEN", with a dash. While trying to get these files to load, I crashed my Amiga twice.

The folks at Dr. T's tell me they found this misnaming shortly after they sent out my copy of DX-Heaven, and that the version actually being shipped has the correct icons. If you happen to get one of the old disks, however, you can use the WorkBench Info option (not the CLI Info command) to reset the icons on your COPY of the DX-Heaven disk. Or, you can do what I did for a temporary fix: ASSIGN DX-HEAVEN: "DX HEAVEN".

Other than this, and the rather harsh slap in the face you receive if you try to back out from the CP disk requester, I found DX-Heaven to be well written and easy to use. It seems to be a very solid program, and should be worth the price to anyone who does a lot of patch programming or shuffling. If you're not looking for superficial flash and fancy graphics, and if you just want to get the job done, it comes highly recommended.

•AC•

"It Is To Blush" Department

If you have any doubt that Murphy is alive and well, become a writer. Even if you manage to catch all your own silly mistakes with the help of spelling checkers, friends, and the publication's editors, there are still plenty of places for Murphy to work his magic. In the last few issues a few "bugs" have slipped through—some of them my fault, some of them no one's—and I felt I'd better make you aware of them.

V2.12—In last year's final installment of AmigaNotes I talked about the changes which affected audio on the new Amigas. Since most MIDI interfaces connect to the serial port, I pointed out the pin and voltage changes on the serial port and how they would affect the operation of MIDI interfaces. What I didn't mention was that the parallel port has also changed, which has an impact on parallel port based audio digitizers.

I haven't had an opportunity to look at the schematics for the new machines, but I'm told that three pairs of pins have been swapped on the parallel port, in addition to the change of gender. As with the MIDI interfaces, I called the affected manufacturers to see how they're dealing with the changes.

Dave Reinke of Applied Visions (makers of FutureSound) tells me they are currently supplying an adapter which changes the gender of the port and moves the power pin as needed; you can purchase one for $24.95. Work is proceeding nicely on a new version of FutureSound for the 500 and 2000; it is expected to retail for $199. If you'd like more info, you can call them at (617) 494-5417. This is a new number, as Applied Visions has recently moved; the new address is at the end of the column.

Anthony Wood of SunRize Industries says they've taken this opportunity to completely redesign Perfect Sound. It now uses a faster ADC design, is housed in a box the size of a cigarette package, and uses one potentiometer to control the gain of both stereo channels in tandem. The price is the same as for the older design: $89.95. SunRize will also send you a new digitizer in exchange for your older unit and $25.00. You can reach them at (409) 846-1311 for further details.

In addition to this omission, I made a flat-out silly mistake. I commented "... you can lay FILT's small window over your Pro MIDI or DMCS or whatever screen..." Wrong, wrong, wrong. FILT does exist in its own window, and you can indeed lay this over Pro MIDI's window. However, DMCS uses its own screen, and FILT therefore cannot be overlayed. This applies to many other music programs as well.

There seems to be a conspiracy to prevent AC from properly printing a MIDI interface comparison chart. The first one we printed (AC V2.1) was hopelessly garbled, and I even warned you not to rely on that chart when we printed the updated version. Unfortunately, the updated chart was garbled as well! The "NOTES" column should be last, not first, and all entries in the column are one line lower than they should be. There are a few new MIDI interfaces available and I'll be doing another comparison in a future issue; maybe the third time will be the charm.

V3.1—An entire section somehow dropped out of existence in my discussion of digital synthesis techniques. The loose ends melded together so seamlessly that nothing seems amiss until you realize that the result is so much gobbledegook. The corrected text closes out this month's column.

RESYNTHESIS

Resynthesis is a term for one of my pet approaches. It combines two techniques: Fourier analysis and additive synthesis.

Fourier analysis is basically the "flip side" of additive synthesis. Instead of combining sine waves to create a final product, Fourier analysis breaks a complex waveform down into its component parts.

With resynthesis, we analyze a recording of an existing sound, giving us a set of sine wave frequencies and amplitudes. These waves are then put back together, using additive synthesis, to recreate the original sound.

The advantage of this approach is one of information density. Many of the components of the original waveform may be left out without adversely affecting the resynthesized version. And, once you've broken a sound down into its components you can play games with it—invert envelope profiles, swap or substitute harmonics, and so on. The final product doesn't have to sound *anything* like the original.

SUBTRACTIVE SYNTHESIS

Subtractive synthesis works backwards from additive synthesis (but in a different backward way from Fourier analysis...have I lost you yet?). With additive synthesis, we combine simple sine waves to create a complex output. With subtractive synthesis, we *start* with a complex waveform, and remove what we don't need. This technique was most often used on the older analog synthesizers. Sonix is one of the packages which allows you to experiment with this approach on the Amiga. Start with a harmonic-rich waveform like a sawtooth, then use the filter to remove some of the upper order harmonics. This technique can be used to create credible string and brass sounds with a minimum of effort. Its primary failing is that it is limited in the sounds it can produce; realistic acoustic pianos and plucked strings, for example, are particularly difficult to recreate. (Sonix bypasses this problem by giving you several synthesis methods, including freehand drawing, which you can combine to create the final product.)

—Rick Rae

DX-Heaven Patch Editor/Librarian
Retail price: $149 Copy Protection: Key Disk

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The Command Line

by Rich Falconburg

Last issue we learned to use the DIR command to examine the contents of a disk. While DIR is useful, it doesn't provide us with much information about the files. We can determine which ones are directories, but that's the sum of it. Many times it's helpful to know the size and creation date of a particular file. The LIST command will do this and more. We'll continue with the devs/printers directory for this example. Set your default to this directory and then type LIST.

```
1> LIST
Panasonic_KX-P10xx   4024 rwed 17-Apr-87 03:39:29
starnx10             3492 rwed 17-Apr-87 03:39:41
CBM_MPS1000          4788 rwed 17-Apr-87 03:39:48
ImagewriterII        6956 rwed 17-Apr-87 03:39:52
generic              1088 rwed 17-Apr-87 03:39:55
sg10                 3504 rwed 14-Aug-87
20:29:54
Okimate_20           5848 rwed 17-Apr-87 03:40:14
Epson_JX-80          5928 rwed 17-Apr-87 03:40:25
Epson                5364 rwed 17-Apr-87 03:40:29
HP_LaserJet_PLUS     6244 rwed 17-Apr-87 03:40:33
```

The first column is obviously the file name. The next column is the file size in bytes. If there's nothing in the file or it was improperly closed, this field will say "empty." A directory will have the "Dir" designation in this field. The next column is the protection field. The date and time in the next two columns indicate the creation or modified date and time. So what's this protection field all about, you ask? Currently, not much. Although the field indicates that each file allows read, write, execute, and delete access, the only bit that's used in the present release of AmigaDOS is the one for delete. Let's say you have a Panasonic printer (so I'm biased). To prevent that printer file from being deleted we can set the protection bit for delete to deny that ability. Here's how:

```
1> PROTECT Panasonic_KX-P10xx rwe
1> LIST Panasonic_KX-P10xx
Panasonic_KX-P10xx  4024 rwe- 17-Apr-87 03:39:29
```

The dash where the "d" used to be indicates that delete access has been denied. If you attempt to delete a file so protected, the message "Not Deleted— object is protected from deletion" will be displayed. You can change any of the bits by including or excluding that letter from the PROTECT command. Notice that I checked only this file by providing LIST with the file name. Try this with DIR. No worky. We can use LIST to display only specific information, such as the file name. If you hate typing or you're just lazy (like me) you can use "wild card" substitution. There are no Jokers here, but it means the same thing. Wild cards can be used to tell the system to match certain parts of the input string and substitute the rest of the name where the wild card is. To display all of the Epson printer files enter it this way:

```
1> LIST P Eps#?
Directory "df1:devs/printers/epson#?" on Sunday 06-
Mar-88
Epson_JX-80          5928 rwed 17-Apr-87 03:40:25
Epson                5364 rwed 17-Apr-87 03:40:29
2 files - 26 blocks - 11292 bytes
```

The "P" informs the LIST command to use the following pattern. Some of you are asking "What's this number, question mark stuff? What happened to the asterisk?" For those of you who don't know, a fair percentage of computer operating systems use the asterisk (*) as the "match anything" wild card. AmigaDOS, on the other hand, uses the two characters shown above to perform the same operation. "That's because the asterisk must be used to preface certain special characters, right?" Nope. Not with this command. We use the single quote (') for that. And again, to use the single quote in the name, enter it twice (''). Here's a list of the various special characters that the LIST command uses for wild card operations:

?	Match any single character
%	Match the null string
#<p>	Match zero or more occurrences of <p> where <p> is any pattern of characters
p1|p2	Displays if pattern 1 (p1) or pattern 2 (p2) match
()	Groups patterns together

As mentioned, combining the number sign and question mark together, "#?", informs the system to match anything. We use the parenthesis to group combinations together. Use the question mark alone for single characters such as:

```
1> LIST B?LL
```

This would find Ball, Bell, Bill, Bull, B2LL, etc. For multiple letters use the pound sign.

```
1> LIST B?#L
```

This would find all the examples above as well as BA, B1, B$, B4LLL, etc. To narrow the search requires different combinations of the various special characters. The percent is used for empty strings. The vertical bar (|) provides a logical OR. Following are some examples to help you grasp the concept.

(continued on page 48)

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```
1> LIST P EC#?<- list any file beginning with EC

1> LIST P F#?L<- list only files beginning with F
                 and ending with L

1> LIST P C#?(A|B)<- list files beginning with C and
                     ending in A or B

1> LIST P (%|disk).info<- list .info and disk.info files

1> LIST P A??<- list file with three letters that begin
                with A
```

We've been using the P (pattern) option which informs the LIST command that a search template follows. The S (string) option is useful if you're looking for filenames with certain characters in them. Let's say that you know there's a file with the word "old" in it somewhere, but you're not sure of the rest of the name. We can use the following syntax to find it.

```
1> LIST S old
```

Tough, huh? This will display names such as OldBackup, ThisOldFile, GoldStrike, and Mountlist.old. To get a fast listing we can limit the display to just the filenames by using the QUICK option as in:

```
1> LIST QUICK
```

(You can't shorten this one like the string and pattern options.) If the files were created or modified within the last week, AmigaDOS will insert YESTERDAY, TODAY, or the day of the week into the Date column. If you prefer to see the actual date stamp, enter the following:

```
1> LIST DATES
```

Likewise, if you don't want any dates shown enter it as:

```
1> LIST NODATES
```

This also has the effect of suppressing the Time stamp. The Date field may be put to good use with two other options. SINCE will display files created or modified after a given date. UPTO displays files created or modified before a given date. Any of the following forms are valid (both options must be spelled out as shown):

```
1> LIST SINCE TODAY
1> LIST SINCE MONDAY
1> LIST SINCE 18-DEC-87
1> LIST UPTO YESTERDAY
1> LIST UPTO WEDNESDAY
1> LIST UPTO 5-AUG-86
```

I'm sure you've been wondering how to get a directory listing to the printer. There are a number of ways; one is provided by the LIST command using the TO option. For example:

```
1> LIST TO PRT:
```

You've probably guessed that we can send the output to a file or any known device using this method. Do so by substituting PRT: with a file name or other device specification. There's one more option that's really only useful to programmers or someone familiar with the disk structure. This is the KEYS option. When included in the command line, the block number for the file header or directory is displayed. The number is printed inside brackets between the file name and file size. If you use the LIST command often, you may encounter something like this:

```
1> LIST df1: p (%|disk)(?|%).info
Directory "df1:" on Saturday 19-Mar-88
.info                    35 rwed 27-Feb-88 21:24:32
disk1.info              638 rwed 27-Feb-88 11:34:18
: Hard Disk Icon
disk2.info              618 rwed 27-Feb-88 11:34:39
: Hard Disk Icon - alternate image
Disk.info              1098 rwed 27-Feb-88 21:16:04
4 files - 12 blocks used
```

The colons (:) under the file names above indicate that a comment is attached to the file above it. Because this field is optional, not all files have comments. The FILENOTE command creates a comment in this manner:

```
1> FILENOTE disk1.info "Hard Disk Icon"
```

(If the comment field contains spaces it must be enclosed in quotes. The maximum length is 80 characters.)

Manipulating Files and File Contents

We'll come back to LIST from time to time and you'll begin to get a feel for its capabilities. I prefer it to the normal DIR command so much that I swapped the names on the two. Yes, my friend, you can rename any AmigaDOS command to whatever you prefer. A note of caution here: if a program expects to find a command by its standard name and you've renamed it to something else, you may experience problems. The most vulnerable of these is the RUN command. The best way to avoid the problem is to COPY the command to a new name. Both commands may be used with the optional qualifier TO. RENAME also allows the use of AS. Here are some examples of both methods (Current Directory is ROOT):

```
1> RENAME C/DIR C/TEMP
1> RENAME C/LIST TO C/DIR
1> RENAME C/TEMP AS C/LIST
1> RENAME Clock C/Clock
1> COPY C/EXECUTE C/@
1> COPY C/DIR TO C/ls
1> COPY Clock C/
```

The standard device, directory, and file name specifications may be used with either command. Notice the last example in each group. The operations are nearly equivalent. The difference is that RENAME moves the file to another directory. It has the same effect as copying the file to the new directory and then deleting the file in the source directory. It is, however, device limited. You can't RENAME to another device to move the file. You must use COPY instead. Here, I introduce the second Commandment of CLI:

BEWARE OF DUPLICATE NAMES!!

AmigaDOS does NOT prevent the COPY command from overwriting existing files of the same name. In the example above, if a file named "ls" already exists in that C/ directory, the copy command will replace it with a duplicate of the DIR command now named "ls". Only the protection bit will prevent it. This is not true of the RENAME command. If you try to rename a file to one that exists you'll see the message "Can't rename <oldname> as <newname>". That's why I renamed DIR to TEMP first.

In previous examples we've been working with specific files. It's possible to perform operations on the directory as a whole. For example, to copy the C/ directory to a directory on a disk in DF1: we use the following:

```
1> COPY DF0:C DF1:C
```

If we set our default directory to the one we're copying from, we can drop the source specification and use the normally optional TO qualifier.

```
1> CD DF0:C
1> COPY TO DF1:C
```

Each example requires that the destination directory exist. Because the command directory has no subdirectories, everything goes as planned. Copy the devs/ directory to a scratch disk and see what happens. All the subdirectories are left behind. To get the COPY command to pick up the subdirectories, use the qualifier ALL like so (devs/ must exist):

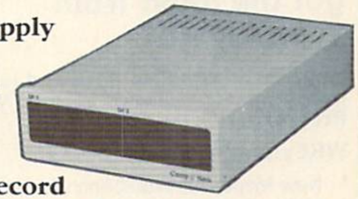
```
1> COPY DF0:devs/ DF1:devs/ ALL
```

Normally, the file names are displayed as they're copied. To suppress this display, use the QUIET qualifier. Both QUIET and ALL may be used with the DELETE command as well. DELETE is similar to COPY but works in reverse. It removes files and directories. Another difference is that DELETE, used without options, won't delete a directory unless it's empty.

WARNING!! When the ALL qualifier is used with the DELETE command, the contents of the directory and all subdirectories are deleted. If this specification is used:

```
1> DELETE DF1:Devs/ ALL
```

(continued)



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The contents of the devs/ directory and each subdirectory, including the directory itself, will be deleted. Take great care when using this option. It's very useful but can cause heartache if you select the wrong directory. Both DELETE and COPY allow wild card pattern matching. Refer to the section on the LIST command for the syntax.

Examining File Contents

Files used by the Amiga are of varying types. The primary distinction is between Binary files (files of binary data or program files) and Text files (files of standard ASCII text). Program files, such as those that make up the command directory, can be RUN and are known as "executables." Some files are binary but will not run and AmigaDOS will return the error message "file is not an object module." This same message will occur if you attempt to run an ASCII text file. We'll talk more of executables later when we get to the RUN command and background operations.

A text file simply consists of standard text similar to what we type when we issue commands at the CLI prompt. Let's create a simple text file using a command we're already familiar with. Enter the following and I'll describe what has happened.

```
1> COPY * TO DemoFile
I've been around and tried the rest
if you ask me, Amiga's the best.
```

To terminate and close the file press CONTROL \ (the backslash next to the BACKSPACE key). In so doing, the CLI prompt will return. We've used a special file name reserved by AmigaDOS, the asterisk, and placed the information from that file into a text file called "DemoFile". Can you guess what happened? AmigaDOS uses the asterisk to identify the current console window. The information typed in the console window is copied to the file. It can be used for both Input and Output. Here we've copied the contents of the console window to DemoFile. It's a simple to create text files. We'll be getting into some more sophisticated text manipulation next issue. Now, to look at the contents of our text file use the TYPE command.

```
1> TYPE DemoFile
I've been around and tried the rest
if you ask me, Amiga's the best.
```

The Amiga uses several text files to control system operation. Let's take a look at one of these using the TYPE command. The S/ (script) directory contains a special file AmigaDOS uses every time the system is Booted. This is where we place instructions to customize our environment. Enter the command string below and examine the output (default directory is ROOT).

```
1> TYPE S/startup-sequence
echo "Workbench disk. Release 1.2 version 33.47"
echo "Use Preferences tool to set date"
echo " "
if EXISTS sys:system
path sys:system add
endif
if EXISTS sys:utilities
path sys:utilities add
endif
BindDrivers
LoadWb
endcli > nil:
```

This is where the paths I mentioned last issue are defined. We'll learn more about the nature of the S/ directory and startup-sequence when we discuss the EXECUTE command. TYPE displays the contents of any file. If it's anything but a text file, however, you'll get some strange results.

You now have enough commands in your arsenal to examine just about everything on a Workbench disk. You've learned about directories and files and several commands to manipulate both. Experiment and get comfortable. Next issue I'll explain what some of these directories are for and suggest ways to customize your Workbench disk.

•AC•

New Cli Window

1>

Reassigning Workbench Disks Without Rebooting

by John Kennan

If you own a single-drive Amiga, you are probably frustrated by the need for frequent disk swaps. One cause for the appearance of the dreaded disk requester is that much of the Amiga's operating system is disk resident. When you restart or reset your Amiga, you are prompted to insert the Workbench disk. When you insert a valid startup disk, it becomes the system disk. From that point on, whenever the Amiga needs to look something up, the Amiga will look for that disk. If the Amiga is looking for AmigaDOS commands, printer drivers, or anything else, and the can't find them, the Amiga will try to check the needed information on the disk you booted on. If the system disk is not in a disk drive, a requester will ask you to reinsert the disk. As the owner of a single drive system, I found this an inconvenience at times; it necessitates frequent disk swaps. This article will focus on a solution to this problem which involves the use of AmigaDOS executable files to change system disks without rebooting. I will assume the user has some familiarity with AmigaDOS. If you have not used an AmigaDOS CLI before, I strongly suggest you purchase an AmigaDOS Manual.

One way to avoid frequent disk swaps is to keep a separate system disk for each major application. For example, I have separate system disks for my word processing, telecommunications, and program development programs. If I want to use a different application, I just reboot on the appropriate system disk. Usually, if the application you are using is on the system disk, you can avoid the repeated appearance of requesters asking for disk swaps. Unfortunately, this is not a very acceptable solution to the problem. Frequently, there are programs or data resident in memory. Rebooting the computer loses everything in memory (except recoverable RAM disks). Besides, rebooting takes time.

The best solution would be to tell the Amiga you want it to start using a new system disk. Fortunately, AmigaDOS includes a command to make this possible: the ASSIGN command.

Open a CLI window and enter "ASSIGN". When ASSIGN is entered without any arguments, AmigaDOS lists current assignments. The typical output of the ASSIGN command looks like this:

```
Volumes:
Textcraft (Mounted)

Directories:
S        Textcraft:s
L        Textcraft:l
C        Textcraft:c
FONTS    Textcraft:fonts
DEVS     Textcraft:devs
LIBS     Textcraft:libs
SYS      Textcraft:

Devices:
DF0  PRT  PAR  SER  RAW
CON  RAM
```

The Amiga uses a system which looks for certain vital information to be held in logical devices.

What is a logical device? Let's say you wanted to take a directory of the disk located in your internal drive. You could type "DIR diskname" where diskname is the name of the disk, or you could type "DIR DF0:". DF0: is a physical device. When you refer to DF0:, the Amiga knows you are referring to the internal drive. It doesn't have to know the name of the disk, because you've told it where the disk is located. A logical device is based on the same idea. C: is the logical device containing AmigaDOS commands. Given the results of the ASSIGN command above, if you were to type "DIR C:", the Amiga would know you wanted the directory of Textcraft:C, because Textcraft:C is the current assignment for C:. This system was implemented to make it easy for the Amiga to find information regardless of its location. In the above example, the ASSIGN command revealed the current assignments (places where required information may be found) for the 7 logical devices in my system. These are:

(continued)

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SYS:	The system disk (generally the disk you booted on)
C:	The command library where AmigaDOS looks for commands
L:	The library directory where parts of the operating system are stored (such as the RAM-Handler)
S:	The sequence directory, where executable files are stored
LIBS:	The library for open library calls
DEVS:	Devices such as printer drivers and clipboards that are not memory resident are found here
FONTS:	Disk resident fonts

For example, if the Amiga needs a printer driver it will look in the logical device DEVS:. In the above example, the DEVS: device has been assigned to the devs directory on a disk named Textcraft.

Earlier, I stated the system of logical devices was implemented to make it easy for the Amiga to find information, regardless of its location. This is necessary because the ASSIGN command also allows us to change the assignments where the Amiga looks for information. For example, if I typed in "ASSIGN FONTS: Terminal:fonts", the Amiga would search on the disk named Terminal in the directory called fonts every time it needed to load a new font.

This lets us reassign everything to another system disk. Unfortunately, a lot of typing and disk swaps would be necessary to completely reassign to a new disk. Rather than do it the hard way, you can implement a Reassign command by creating a DOS executable file to do all the work for you. I have done just that with two listings included in this article. To implement an executable reassign function, you need to type both listings using a word processor or text editor. The files must be saved as ASCII text files, and copies of each file should be stored in the s directories on your various system disks. Thus, the listings should be saved as S/REASSIGN and S/REASSIGN1. Once both listings are saved, you're ready to go.

To reassign to a new system disk, go to a CLI window and type "EXECUTE REASSIGN". After a few seconds, the Amiga will prompt you for the name of the disk you want as the new system disk. Type the name of the disk, followed by a colon. For example, to reassign to a disk named Terminal, enter "TERMINAL:" at the prompt. After a few seconds, the Amiga will request that you insert the disk named Terminal. If you insert the disk, the Amiga will proceed to reassign all the logical devices to the new disk. Remember to give each system disk a unique name, or the Amiga will just reassign back to the original system disk.

Listing One: Reassign

```
IF NOT EXISTS RAM:T
  MAKEDIR RAM:T
ENDIF
COPY S:Reassignl to RAM:T
COPY C:Assign to RAM:T
CD RAM:
EXECUTE T/Reassignl ?
```

Listing Two: Reassign1

```
.KEY DName
IF EXISTS <DName>
 T/ASSIGN C: <Dname>c
 T/ASSIGN SYS: <DName>
 T/ASSIGN L: <DName>L
 T/ASSIGN S: <DName>S
 T/ASSIGN FONTS: <DName>FONTS
 T/ASSIGN DEVS: <DName>DEVS
 T/ASSIGN LIBS: <DName>LIBS
 CD <DName>
ELSE
 CD SYS:
ENDIF
PATH RESET C: SYS:Utilities SYS:System
RUN DELETE RAM:T ALL
```

Both listings perform important roles in implementing the reassign command. The file called Reassign is the executable file the user invokes to reassign to a new disk. The first thing Reassign does is check for the presence of a T directory in the RAM: disk. If it doesn't exist, it creates one. It does this because certain operations require the Amiga to

(continued on page 54)

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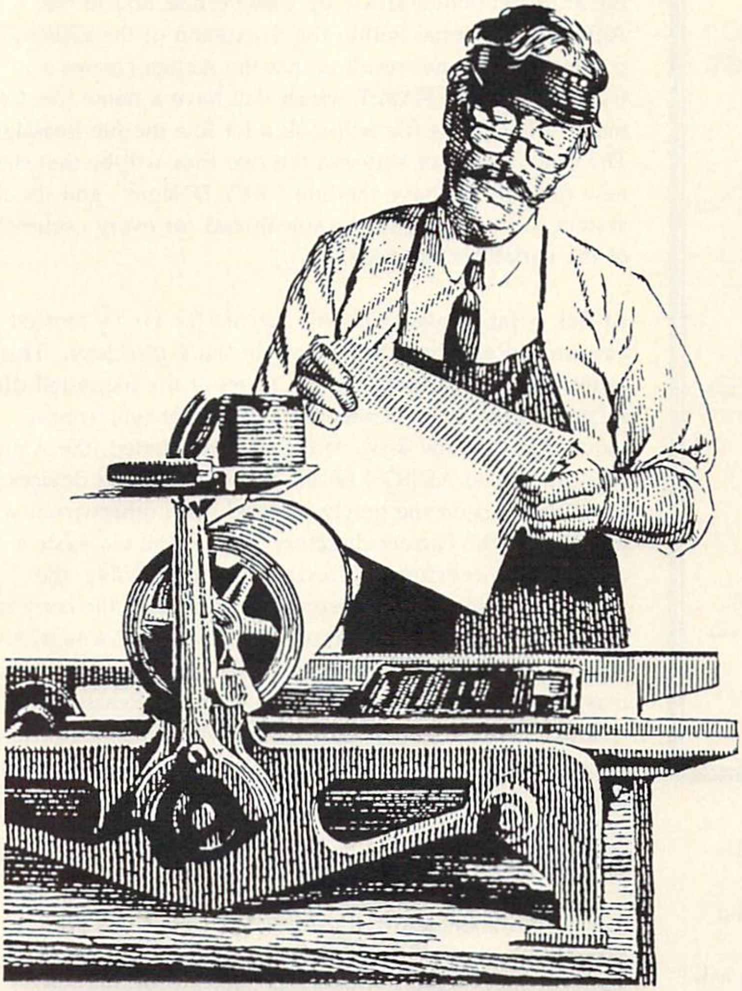

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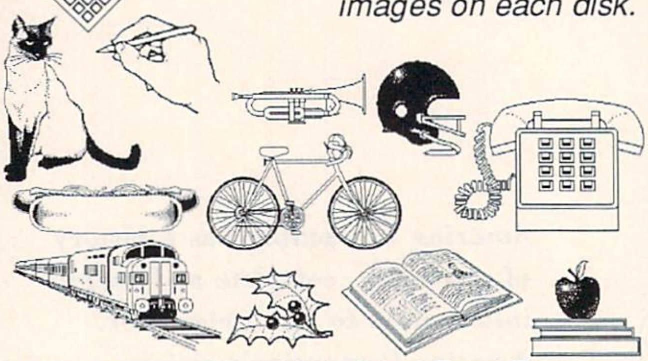

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create temporary files, which are always placed in the T directory. By creating a T directory in RAM:, and later changing RAM: to the current directory, we can force the Amiga to write these temporary files to the RAM disk. Later, when we change disks, the Amiga won't have to ask for the old system disk to access the temporary file. This also allows the program to delete the temporary file easily.

Next, AmigaDOS will move the file Reassign1 and the command ASSIGN to the T directory of the RAM disk. Now the program changes the current directory to RAM:. The Amiga is now set up so once the user is prompted to insert a new disk, the program will not have to refer back to the old system disk.

Now AmigaDOS invokes the executable file Reassign1. The technique used here was described by Udo Pernisz in AC V3.5. The line "Execute RAM:T/Reassign1 ?" causes the Amiga to execute the file Reassign1. The question mark causes the Amiga to prompt us to enter the parameters required by the file Reassign1. If we look at the first line of Reassign1, we see the line ".KEY DName". This means the executable file is expecting a parameter to be used by the variable DName. The net result is, when the user types "EXECUTE REASSIGN", the Amiga will eventually display a prompt for the parameter for the file REASSIGN1 by displaying "DName:". The user should type the name of the new system disk. AmigaDOS uses Parameter value substitution to execute Listing 2. This subject is described in the aforementioned article by Udo Pernisz and in the AmigaDOS manual within the discussion of the EXECUTE command. The net result is that the Amiga creates a temporary file in RAM:T which will have a name like Command-0-T01. This file will look a lot like the file Reassign1. The only difference between the two files will be that the new file will not have the line ".KEY DName", and the new system disk's name will be substituted for every occurrence of the variable <DName>.

At this point, AmigaDOS will execute the newly created version of Reassign1 that is now in the T directory. This causes the Amiga to check first to see if the requested disk exists. To the user, this means a requester will appear requesting the new disk. If the disk is inserted, the Amiga will proceed to ASSIGN all the necessary logical devices to the directories on the newly inserted disk; otherwise it will just change the current directory back to the old system disk. At the conclusion of executing REASSIGN1, the Amiga will delete the T directory, eliminating the copy of REASSIGN1 and the temporary file created by AmigaDOS. If for some reason, you require a T directory in RAM:, you may want to change the last line of the file Reassign1 to "DELETE RAM:T/Reassign1 RAM:T/Assign". This will at least delete two of the unnecessary files, while leaving the T directory untouched.

The Amiga has now been reassigned to a new system disk. If, you have copies of both these files on all your system disks, even a single-drive user will be able to move smoothly between the disks, minimizing the hassle of repeated disk swaps. If you maintain major application programs on separate system disks, Reassign will aid you in moving smoothly from application to application.

I must point out that there are difficulties with this scheme. If a program is running before the REASSIGN file is executed, that program may still want to refer back to the old system disk, so an occasional disk swap may still be necessary. Another problem is this scheme does seem to confuse the Workbench environment. After Reassign has been invoked, inserting a disk and then removing it results in the disk's icon remaining on the screen indefinitely. If your use of the machine involves inserting many disks, the Workbench display will begin to look somewhat cluttered. This will not be a problem during ordinary use of the machine, since it doesn't interfere with operation of the Amiga. Of course, if the problem becomes annoying you can always reboot the machine, and everything will revert to normal.

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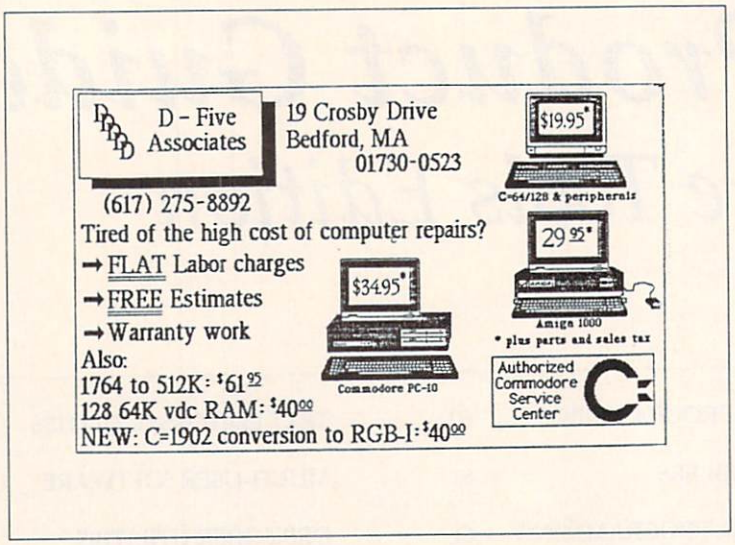
Amiga Product Guide:

Software Tools Edition

CAD 58
PCB DESIGN 58
DIGITAL/SCHEMATIC DESIGN 58
DATABASES 58
DESKTOP PRESENTATION 59
DESKTOP PUBLISHING 59
IDEA PROCESSORS 59
MODULA-2 PROGRAMMING 59
C PROGRAMMING 60
BASIC PROGRAMMING 60
ASSEMBLERS 61
PASCAL PROGRAMMING 61
FORTH PROGRAMMING 61
FORTRAN PROGRAMMING 61
OTHER LANGUAGES 62
SHELLS 62
PROGRAMMING UTILITIES 62
TEXTBOOKS 67
PROGRAMMING BOOKS 67
TEXT EDITORS/UTILITIES 67
MULTI-USER SOFTWARE 68
DEBUGGER UTILITIES 68
DISK UTILITIES 68
PROGRAMMING UTILITIES 68
CLI/WORKBENCH UTILITIES 69
FILE TRANSFER 69
SPREADSHEETS 69
SPELLING CHECKERS 70
WORD PROCESSORS 70
VENDOR LIST 72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A Workbench "More" Program by Rick Wirch
Amiga BBS numbers

Volume 1 Number 3 April 1986

Analyze! a review by Ernest Viverios
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Volume 1 Number 4 May 1986

SkyFox and Articfox Reviewed
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Volume 1 Number 6 1986

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on the Amiga by Gerald Hull

Volume 1 Number 8 1986

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Volume 1 Number 9 1986

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Volume 2 Number 1 1987

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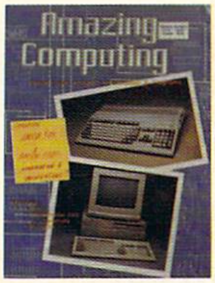

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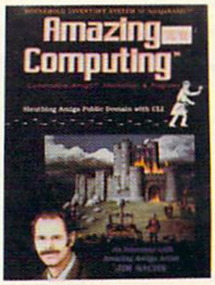

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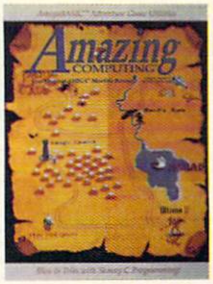

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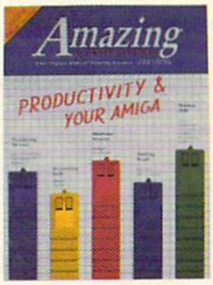

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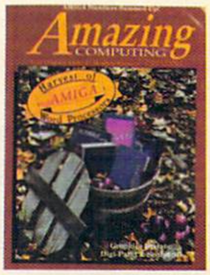

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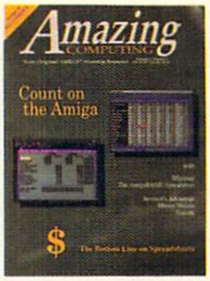

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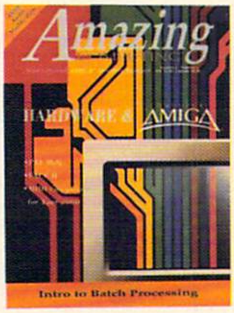

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VOLUME 3.4

Volume 2 Number 3

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Volume 2 Number 4 1987

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The Mouse That Got Restored by Jerry Hull and Bob Rhode
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Speaker Sessions: San Francisco Commodore Show H Tolly
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Volume 2 Number 5 1987

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Volume 2 Number 6 1987

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Calls to AmigaDOS and the ROM kernal.
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Explanation of Amiga expansion peripherals.
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by Chris Martin
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AmigaNotes by Rae, Richard A look at FutureSound
**Commodore Shows the Amiga 2000 and 500 at the Boston
Computer Society** by H Maybeck Tolly

Volume 2, Number 7 1987

New Breed of Video Products by John Foust...
Very Vivid! by Tim Grantham...
Video and Your Amiga by Oran Sands III
Amigas & Weather Forecasting by Brenden Larson
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Prism HAM Editor from Impulse by Jennifer M. Janik
Easyl drawing tablet by John Foust..
CSA's Turbo-Amiga Tower by Alfred Aburto
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Volume 2, Number 8 1987

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Volume 2 Number 9 1987

Analyze 2.0 reviewed by Kim Schaffer
Impact Business Graphics review by Chuck Raudonis
Microfiche Filer review by Harv Laser
Pagesetter review by Rick Wirch
Gizmoz Productivity Set 2.0 review by Bob Eller
Kickwork review by Harv Laser
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Mouse Time and Timesaver review by John Foust
Insider Memory Expansion review by James O'Keane
Microbotics Starboard-2 review by S. Faiwiszewski
Leather Goddess of Phobos
reviewed by Harriet Maybeck-Tolly
Lattice C Compiler Version 3.10 reviewed by Gary Sarff
Manx 3.4a Update reviewed by John Foust
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AC-BASIC Compiler an alternative comparison by B Catley
Modula-2 Programming S Faiwiszewski
Raw Console Device Events
Directory Listings Under AmigaDOS by Dave Haynie
AmigaBASIC Patterns by Brian Catley
Programming with Soundscape
Todor Fay manipulate's samples
Bill Volk, Vice-President Aegis Development,
interviewed by Steve Hull
Jim Goodnow, Devekoper of Manx 'C'
interview by Harriet M Tolly

Volume 2 Number 10 1987

Max Headroom and the Amiga by John Foust
Taking the Perfect Screen Shot by Keith Conforti
Amiga Artist: Brian Williams by John Foust
**Amiga Forum on Compuserve™... Software Publishing
Conference Transcript** by Richard Rae
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dBMAN reviewed by Clifford Kent
Amiga Pascal reviewed by Michael McNeil
AC-BASIC Compiler reviewed by Bryan Catley
Bug Bytes by John Steiner
Amiga Notes by Richard Rae
Roomers by The Bandito
68000 Assembly Language by Chris Martin
The AMICUS Network by John Foust
Amiga Programming:
Amiga BASIC Structures by Steve Michel
Quick and Dirty Bobs by Michael Swinger
Directory Listings Under Amiga-DOS, Part II by Dave Haynie
Fast File I/O with Modula-2 by Steve Faiwiszewski
Window I/O by Read Predmore

Volume 2 Number 11 1987

Word Processors Rundown by Geoff Gamble
ProWrite, Scribble!, and WordPerfect compared
LPD Writer Review by Marion Deland
VizaWrite Review by Harv Laser
Aedit Review by Warren Block
WordPerfect Preview by Harv Laser
Jez San Interview by Ed Bercovitz
The author of StarGlider speaks!
Do-it-yourself Improvements to the Amiga Genlock
Digi-Paint Review by Harv Laser
Sculpt 3D Review by Steve Pietrowicz
Shadowgate Review by Linda Kaplan
TeleGames Review by Michael T. Cabral
Reason Preview: a quick look at an
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Gizmoz V2.0 and Zing! Keys
Bug Bytes by John Steiner
AmigaNotes by R Rae 4 electronic music books
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devices, I/O, and the serial port
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68000 Assembly Language by Chris Martin
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(continued from page 62)

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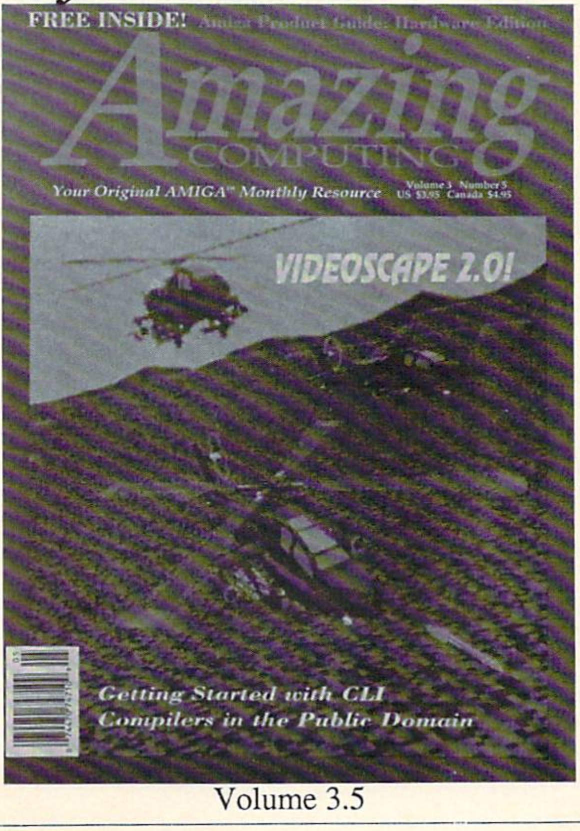
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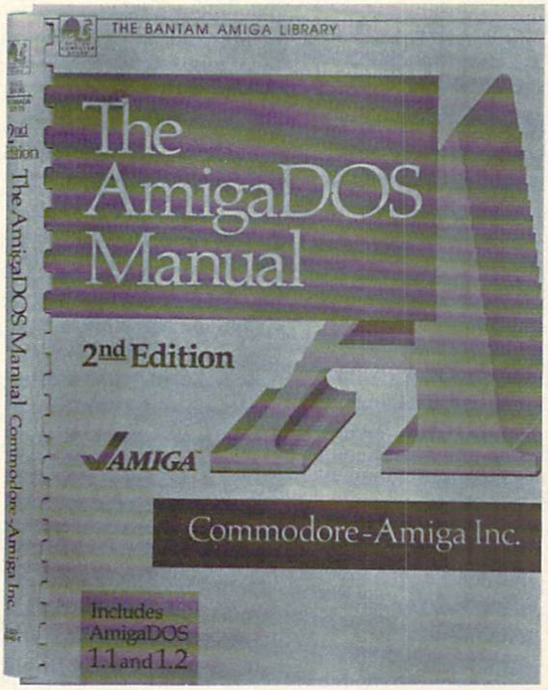

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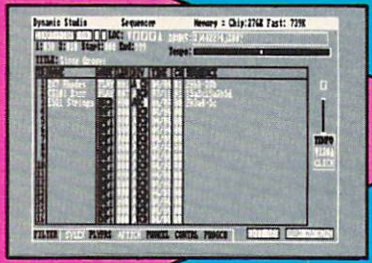

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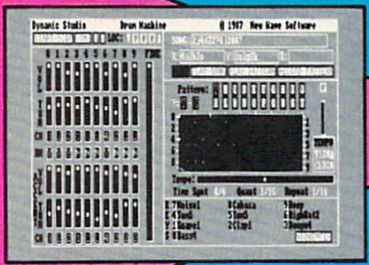

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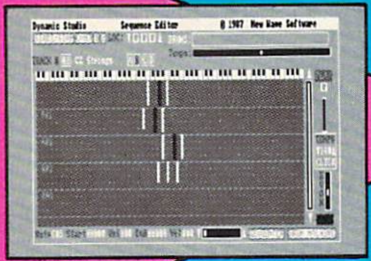

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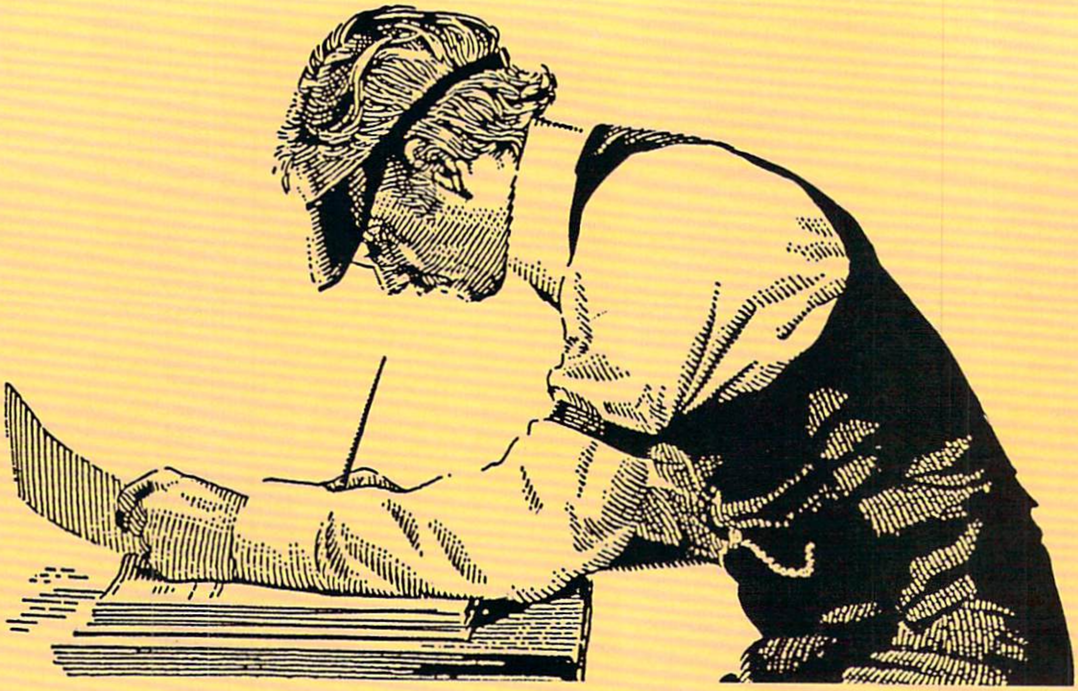

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An IFF Reader In Multi-Forth

by Warren Block

Almost all Amiga graphics programs create and use IFF-format data files. This is good and bad. It is good because the IFF format is compatible with many different programs, and it is bad because of the added level of complexity it necessitates in those programs.

When you program in C, IFF examples and routines abound, so it really isn't too hard to make your programs IFF-compatible. Unfortunately, most of the secondary Amiga languages don't include IFF routines, which forces you to write your own. Multi-Forth is one of these languages. Creative Solutions has provided almost everything else with the language, except IFF routines.

Since a general-purpose IFF reader module is a tool that can be used many times, it is worth the extra effort to make it fast, small, and robust enough to survive foreseeable errors. The Multi-Forth IFF module presented here ("GetIFFBlob") has most of these qualities, and also serves as a showcase for some of Multi-Forth's unusual features.

Description

An ideal IFF reader should be very simple to use. GetIFFBlob needs only the address of a zero-terminated filename as a parameter, and does its own memory allocation and initialization. It returns pointers to standard Amiga structures (a BitMap, a BitMapHeader, and a ColorTable) which are ready for use by the application programs. Errors are handled simply: structures that could not be created because of an error are simply returned as a NULL pointer. While this doesn't tell the calling program what went wrong, it suffices for most uses. Should your program need more information, it can attempt to get a DOS lock on the file. If the lock value returned is non-zero, the file exists. If the file exists and there was an error, the Multi-Forth word IOERROR? will return the error code of the latest AmigaDOS error. When no error has occurred, but GetIFFBlob has returned NULL pointers, it is probably the result of trying to read a file that isn't IFF in the first place. This enables GetIFFBlob to read files that are partially obscured by disk read/write errors—at least those portions of file that occur before the errors are loaded normally.

Most of the words make heavy use of Multi-Forth's local variables, a handy construct. Also, globals are used (another feature provided by Multi-Forth). With local and global variables and structures, Forth has finally been brought up to current sophistication levels in programming languages. (Those who are typing these programs from the listings should note that local variable definitions shouldn't be broken into two lines; it will make the compiler freak out.)

The complete package consists of three files: ilbm.f (structure and constant definition), iff.f (the iff reader routines themselves), and ifftest.f, a program to test and demonstrate the use of the reader routines. Ifftest checks on the size of the source page of a graphic image, and uses that data to decide what size screen and window to open. The actual image is then blitted into the window. So full-screen IFF pictures and DPaint brushes or Images "windows" are read equally well. BltBitMapRastPort is used to blit the IFF BitMap into the window's RastPort, because it takes fewer parameters than BltBitMap. When the picture is finally displayed, the program uses the Exec Wait function to wait for a CTRL-C, then deallocates everything and exits.

Of special interest in GetIFFBlob is the GetPixelData word. It checks the compression type used (found in the BitMapHeader structure) and sets the global variable IFFCompVector to the token value of either ReadPlainRow or ReadCompRow accordingly. Later, when ReadLine is called, it EXECUTEs the token value contained in IFFCompVector. This eliminates the need to check on the compression type for every line, and helps speed things along.

BitMapHeader structures turn out to be very useful for things other than IFF files. For instance, they make good descriptors of Bobs when using the Gels system.

(continued)

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Memory allocation has been carefully checked and verified—everything allocated is later freed (although it is up to the calling program to free memory used by the returned structures). This has been simplified by providing "smart" deallocation routines (found in iff.f). When your program is finished with the structures, simply have it pass the pointers to these routines, and they'll take care of the details.

Chip memory is used only when absolutely necessary; public memory is requested for all other needs. It makes no difference on a 512K Amiga, but it is immediately obvious on machines with expansion memory. With extra RAM becoming more and more common, all programs will have to be written this way, so you might as well do it correctly in the first place and avoid the hassle of later modifications.

Be sure to call GetIFFBlob with a zero-terminated string for the filename. The address is used directly in calls to AmigaDOS, and these calls won't work correctly with normal Forth strings.

Problems, Quirks, And Details

GetIFFBlob isn't perfect. (Of course, the ideal program could be written and debugged in fifteen seconds, would require no memory, and run instantly.) First off, it is memory-hungry. For speed, it loads the entire file into RAM (Fast RAM, if available) and decodes it from there. For typical pictures, this is a 30-40K chunk of memory. This RAM is freed after decoding is completed, but if the memory situation is tight, a crash could result from the attempt to allocate it in the first place.

Besides the file buffer, memory is also allocated for a BitMap structure and its associated bitplanes, a 32-entry ColorTable (even though the actual color data may have less than 32 entries), and a BitMapHeader. Although they are currently unimplemented, there are provisions for adding new types of IFF hunks like CCRTs, CRNGs, and CAMGs. These will take even more memory. The small size of Forth programs helps offset the reader's appetite for memory somewhat.

If this is unacceptable for your application, the RAM pseudo-file, used by GetIFFBlob, would make it relatively simple to convert back to reading straight from disk. It will probably also result in a drop in speed. (The original disk-based version of the program took 22 seconds to load a picture that the current version loads in three seconds.)

Routines to write IFF files have not been implemented because I have no need for them yet. Another flaw: the routines presented here are only capable of reading graphics files. In the real world, an IFF file can be much more complex than expected (e.g. sampled sounds, songs, text, or other complex constructions). All these things could also be combined in a single file.

Conclusion

Although GetIFFBlob may be somewhat crude, the fact that it quickly loads ordinary Amiga graphics files has made it a very useful addition to my Forth toolbox.

I would be like to hear about suggestions or modifications you may have made to these routines. Those interested may write directly to me at 1921 Fifth, Apt. 3, Rapid City, SD 57701. I can't promise a reply, although a SASE will make one much more likely.

Listing One: "ilbm.f"

```
\ IFF graphics structures and constants.
\ Warren Block, December 12, 1987.

FIND IFF_ILBM_F NOT
IFTRUE  : IFF_ILBM_F ;
        ." Compiling iff/ilbm.f "  CR
OTHERWISE  prior.stream
IFEND

HEX  \ IFF identifiers.

ASCII FORM  CONSTANT IFF.FORM
ASCII ILBM  CONSTANT IFF.ILBM
ASCII BMHD  CONSTANT IFF.BMHD
ASCII CMAP  CONSTANT IFF.CMAP
ASCII BODY  CONSTANT IFF.BODY
ASCII CAMG  CONSTANT IFF.CAMG
ASCII CCRT  CONSTANT IFF.CCRT

DECIMAL

\ Pixel compression methods-none, and
\ wimpy Mac graphics compression method.

0 CONSTANT IFF.cmpNONE
1 CONSTANT IFF.cmpByteRun1

  4 CONSTANT IFFFieldSize
 64 CONSTANT ColorTableSize
260 CONSTANT FileInfoBlockSize

\ IFF BitMapHeader structure

structure BitMapHeader
   short: +bmhW
   short: +bmhH
   short: +bmhX           \ signed integer-x offset
   short: +bmhY           \ signed integer-y offset
    byte: +bmhnPlanes
    byte: +bmhMasking
    byte: +bmhCompression
    byte: +bmhpad1
   short: +bmhtransparentColor
    byte: +bmhxAspect
    byte: +bmhyAspect
   short: +bmhpageWidth
   short: +bmhpageHeight
structure.end

\ A CycleInfo is what you get from a CCRT chunk.
structure CycleInfo
   short: +ccrtDirection
    byte: +ccrtStart
    byte: +ccrtEnd
    long: +ccrtSeconds
    long: +ccrtMicroseconds
   short: +ccrtPad
structure.end

\ A CRange comes from a CRNG chunk.
structure CRange
   short: +crngPad1
   short: +crngRate
   short: +crngActive
    byte: +crngLow
    byte: +crngHigh
structure.end
```

Listing Two: "iff.f"

```
\ Stuff for reading IFF graphics files, by Warren
\ Block, December 12, 1987.  Maybe not the best
\ code in the world...but I've seen worse.
\

SYMTABLE DEFINITIONS

FIND IFF_ILBM_F NOT
IFTRUE   include df1:iff/ilbm.f
IFEND

FORTH DEFINITIONS

FIND IFF_IFF_F NOT
IFTRUE  : IFF_IFF_F ;
        ." Compiling iff/iff.f "  CR
OTHERWISE  prior.stream
IFEND

DECIMAL

GLOBAL IFFBuffer         \ RAM pseudo-file address
GLOBAL IFFEOF            \ End of IFFBuffer
GLOBAL IFFLocation       \ Location in file
GLOBAL IFFError          \ TRUE if error has occurred
GLOBAL IFFCompVector     \ Compressed/plain vector

\ AmigaDOS Examine call-get info about a file.
: Examine   ( lock fib - err )
   !D2 !D1 DOS@ 17 ;

\ Calculate address from an index to an array of
\ addresses.  Very slight speed disadvantage, but
\ much easier to read.
: 'th.Address    ( base i - base+i*4 )
   4* + ;

\ Deallocate a BitMap's bitplanes.
: FreePlanes    ( bmap - )
   LOCALS| bmap |
   bmap +bmDepth C@ 0 DO
     bmap +bmPlanes I 'th.Address @
     ?DUP IF
       bmap +bmBytesPerRow W@ 8*
       bmap +bmRows W@  FreeRaster
     THEN
   LOOP ;

\ Free a bitmap and bitplane memory.
: FreeBMap    ( bmap - )
   ?DUP IF  DUP FreePlanes  BitMap FreeMem  THEN ;

: FreeCTab    ( ctab - )  \ Free a color table.
   ?DUP IF  ColorTableSize FreeMem  THEN ;

: FreeBMH     ( bmh - )  \ Free a BitMapHeader.
   ?DUP IF  BitMapHeader FreeMem  THEN ;
```

(continued)

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```
: FreeCAMG   ( camg - )   \ Free a CAMG chunk.
    ?DUP IF   { free it }   THEN ;

: FreeCCRT   ( ccrt - )   \ Free a CCRT chunk.
    ?DUP IF   { free it }   THEN ;

\ Update location of IFF pseudo-file pointer,
\ check if read has gone past EOF, set error flag.
: UpdateIFFLoc    ( inc - )
    IFFLocation + TO IFFLocation
    IFFLocation IFFEOF > IF  FALSE TO IFFError  THEN ;

\ Read an IFF ID or ID length.  Why all this,
\ rather than a simple fetch?  Because the data
\ came from a character-oriented file, and may
\ not be word-aligned.  Trust me.
: GetIFFField    ( - value )
    0 4 0 DO
      IFFLocation I+ C@ SWAP 8 SCALE +
    LOOP 4 UpdateIFFLoc ;

: GetIFFBMHD    ( - bmh )  \ Read BitMapHeader.
    NULL 0 LOCALS| bmhdlen bmhd |
    GetIFFField TO bmhdlen
    bmhdlen MEMF_PUBLIC MEMF_CLEAR | AllocMem
    TO bmhd
    bmhd IF
      IFFLocation bmhd bmhdlen CMOVE
      bmhdlen UpdateIFFLoc
    THEN
    bmhd ;

\ Convert RGB bytes to a word.
: RGB>Word    ( r g b - word )
    SWAP 4 SCALE OR SWAP 8 SCALE OR ;

\ Get RGB byte values from an address.
: GetRGB    ( addr - r g b )
    DUP 3 + SWAP DO  IC@ -4 SCALE 15 AND  LOOP ;

\ Copy an IFF CMAP into a real ColorTable.
: MakeColorTable    ( size cmap ctab - )
    LOCALS| ctab cmap |
    3 / 0 DO
      cmap I 3 * + GetRGB  RGB>Word ctab I 2* + W!
    LOOP ;

\ Read an IFF CMAP-which is not the
\ same as an Amiga ColorMap.  Sigh.
: GetIFFCMAP    ( - ctab )
    0 NULL LOCALS| ctab ctabsize |
    GetIFFField TO ctabsize
    ColorTableSize MEMF_CHIP MEMF_CLEAR | AllocMem
    TO ctab
    ctab IF
      ctabsize IFFLocation ctab MakeColorTable
      ctabsize UpdateIFFLoc
    THEN
    ctab ;

\ Initialize a Bitmap according to a
\ BitMapHeader's size information.
: SetUpBitMap    ( bmap bmh - )
    LOCALS| bmh |
    bmh +bmhnPlanes C@
    bmh +bmhW W@
    bmh +bmhH W@  InitBitMap ;

\ Allocate a bitplane of the size
\ indicated by the BitMapHeader.
: GetRaster     ( bmh - raster )
    DUP  +bmhW W@
    SWAP +bmhH W@ AllocRaster ;

\ Get bitplanes needed for an image.
: GetPlanes    ( bmap bmh - )
    LOCALS| bmh bmap |
    bmh +bmhnPlanes C@ 0 DO
      bmh GetRaster  ?DUP IF
        bmap +bmPlanes  I 'th.Address !
      ELSE
        bmap FreePlanes     \ Error-free all planes.
        FALSE TO IFFError
        LEAVE               \ Exit loop early.
      THEN
    LOOP ;

\ Given a base address and the length of a row in
\ bytes, read a compressed row of data.
: ReadCompRow    ( addr bytesperrow - )
   0 0 0 LOCALS| countsave bytecount readaddr bytesperrow addr
|
   BEGIN
     bytecount bytesperrow <
   WHILE
     addr bytecount + TO readaddr
     IFFLocation C@ DUP
     1 UpdateIFFLoc
     128 > IF
       257 SWAP -
       readaddr SWAP
       DUP TO countsave
       IFFLocation C@
       FILL
       1
     ELSE
       1+
       IFFLocation SWAP
       readaddr SWAP
       DUP TO countsave
       CMOVE
       countsave
     THEN
     UpdateIFFLoc
     countsave bytecount + TO bytecount
   REPEAT ;

\ Read an uncompressed row.
: ReadPlainRow    ( addr bytesperrow - )
   LOCALS| bytesperrow dest |
   IFFLocation dest bytesperrow CMOVE
   bytesperrow UpdateIFFLoc ;

\ Read a line-that is, all the rows for one line
\ of a picture.  Note that this word vectors
\ execution to ReadPlainRow or ReadCompRow
\ according to the vector that is set up in
\ GetPixelData (see below).
: ReadLine    ( line# bmap bmh - )
   LOCALS| bmh bmap line# |
   bmap +bmDepth C@ 0 DO
     bmap +bmPlanes I 'th.Address @
     bmap +bmBytesPerRow W@ DUP
     line# * ROT +
     SWAP IFFCompVector EXECUTE
   LOOP ;

: GetPixelData    ( bmap bmh - )
   LOCALS| bmh bmap |
   bmh +bmhCompression C@
   CASE
     IFF.cmpNONE      OF
       TOKEN.FOR ReadPlainRow TO IFFCompVector
     ENDOF
     IFF.cmpByteRun1 OF
       TOKEN.FOR ReadCompRow  TO IFFCompVector
     ENDOF
 { ELSE }
      FALSE TO IFFError
   ENDCASE
   IFFError IF
     bmh +bmhH W@ 0 DO
       I bmap bmh ReadLine
     LOOP
   THEN ;

\ Load an IFF BODY-the actual bitplane data.
: GetIFFBODY    ( bmh - bmap or FALSE )
   NULL LOCALS| bmap bmh |
   GetIFFField DROP
   BitMap MEMF_CHIP MEMF_CLEAR | AllocMem TO bmap
   bmap IF
     bmap bmh SetUpBitMap
     bmap bmh GetPlanes
     IFFError IF
       bmap bmh GetPixelData
     ELSE
       bmap FreeBMap
       NULL TO bmap
     THEN
   THEN
   bmap ;

: GetIFFCAMG    ( - camg )  \ Beats me.
   GetIFFField
   UpDateIFFLoc    \ skip the whole thing for now
   NULL ;

: GetIFFCCRT    ( - ccrt )  \ Something about
   GetIFFField                \ color cycling.
   UpdateIFFLoc               \ Skip it.
   NULL ;

\ Skip over an unknown type of IFF chunk.
: GetIFFUnknown    ( - )
   GetIFFField
   UpdateIFFLoc ;


\ GetIFFBlob    ( O$addr - bmap bmh ctab camg ccrt )
\
\ Load an IFF InterLeavedBitMap (ILBM) picture or brush.
\
\ O$addr points to the filename, bmap, bmh, ctab,
\ camg, and ccrt are returned pointers.
\
\ Any non-NULL returns have to be deallocated by
\ the calling program.  For this purpose, the
\ routines FreeBMap, FreeBMH, FreeCTab, FreeCAMG,
\ and FreeCCRT are provided.  These are "smart"
\ routines and won't attempt to deallocate a NULL
\ pointer in case you screw up and send them one.

: GetIFFBlob    ( O$addr - bmap bmh ctab camg ccrt )
   0 0 0 NULL NULL NULL NULL NULL
   LOCALS| bmap bmh ctab camg ccrt iffhandle ifffilesize
ifflock name |
   FileInfoBlockSize MEMF_PUBLIC MEMF_CLEAR | AllocMem
   ?DUP IF
     name RO LOCK TO ifflock
     ifflock IF
       DUP ifflock SWAP Examine  DROP
       DUP 124 + @ TO ifffilesize  \ +fibSize = 124 +
       name Open TO iffhandle
       iffhandle IF
         ifffilesize MEMF_PUBLIC MEMF_CLEAR | AllocMem
         TO IFFBuffer
         IFFBuffer IF
           \ load the whole file
           IFFBuffer ifffilesize iffhandle READ
           iffhandle Close
           ifflock  UnLock
           ifffilesize = IF
             IFFBuffer TO IFFLocation
             IFFBuffer ifffilesize + TO IFFEOF
             GetIFFField  DROP          \ IFF.FORM
             GetIFFField  DROP          \ form length
             GetIFFField IFF.ILBM = TO IFFError

             BEGIN
               bmh bmap AND
               ctab     AND
               camg     AND
               ccrt     AND NOT
               IFFError AND
             WHILE
               GetIFFField
               CASE
                 IFF.BMHD  OF
                   GetIFFBMHD TO bmh
```

(continued)

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```
                 ENDOF
                 IFF.CMAP  OF
                   GetIFFCMAP TO ctab
                 ENDOF
                 IFF.BODY  OF
                   bmh GetIFFBODY TO bmap
                 ENDOF
                 IFF.CAMG  OF
                   GetIFFCAMG TO camg
                 ENDOF
                 IFF.CCRT  OF
                   GetIFFCCRT TO ccrt
                 ENDOF
             { ELSE }
                 IFFError IF  GetIFFUnknown  THEN
               ENDCASE
             REPEAT
           THEN
           IFFBuffer ifffilesize FreeMem
         THEN
       THEN
     THEN
     FileInfoBlockSize FreeMem
   THEN
   bmap bmh ctab camg ccrt ;

\ "Hide" IFF global variables from the user.

AXE IFFBuffer   AXE IFFEOF         AXE IFFLocation
AXE IFFError    AXE IFFCompVector
```

Listing Three: "ifftest.f"

```
\ Stuff for testing IFF routines.

FIND IFF_IFF_F NOT
IFTRUE   include df1:iff/iff.f
IFEND

DECIMAL
FORTH DEFINITIONS

DECIMAL
ANew IFFTestMarker

struct NewScreen ns
ns InitScreen
  0 ns +nsDetailPen C!
  1 ns +nsBlockPen  C!
  CUSTOMSCREEN SCREENQUIET | ns +nsType W!
structend

struct NewWindow nw
   nw InitWindow
        0 nw +nwLeftEdge   W!
        0 nw +nwTopEdge    W!
        0 nw +nwDetailPen  C!
        1 nw +nwBlockPen   C!
     NULL nw +nwIDCMPFlags  !
   BORDERLESS nw +nwFlags !
   CUSTOMSCREEN nw +nwType W!
structend

VARIABLE tbmap     \ pointer to BitMap
VARIABLE tbmhd     \ pointer to BitMapHeader
VARIABLE tctab     \ pointer to ColorTable
VARIABLE tcamg     \ pointer to CAMG
VARIABLE tccrt     \ pointer to CCRT

\ The Exec Wait function–different from the
\ Wait word in Multi-Forth.

: ExecWait    ( signals – signals )
  !D0 Exec@ 53 ;

4096 CONSTANT SIG_CTRL-C
```

```
\ IFFTest requires a zero-terminated string
\ address on the stack.  Typical usage is:
\
\      0" mandel.pic" ifftest
\
\ After viewing, press CTRL-C to exit.


: IFFTest    ( 0$addr – )
 GetIFFBlob                   \ load the picture

 tccrt ! tcamg ! tctab !    \ save return values
 tbmhd ! tbmap !

 tbmap @ NOT      \ verify that all the needed
 tbmhd @ NOT OR   \ fields were actually read
 tctab @ NOT OR
 NOT IF

   \ use the actual size of the graphic's source
   \ page to set the size of the test screen
   tbmhd @ +bmhpageWidth W@ 320 > IF
     640  ns +nsWidth W!
     640  nw +nwWidth W!
     HIRES ns +nsViewModes W!
   ELSE
     320  ns +nsWidth W!
     320  nw +nwWidth W!
     NULL ns +nsViewModes W!
   THEN

   tbmhd @ +bmhpageHeight W@ 200 > IF
     400 ns +nsHeight W!
     400 nw +nwHeight W!
     ns +nsViewModes W@
     LACE | ns +nsViewModes W!
   ELSE
     200 ns +nsHeight W!
     200 nw +nwHeight W!
   THEN

   tbmhd @ +bmhnPlanes C@
   ns +nsDepth  W!

   \ Open the custom screen and window
   ns OpenScreen VerifyScreen
   CurrentScreen @ nw +nwScreen !
   nw OpenWindow VerifyWindow

   \ Set the colors
   CurrentScreen @
   +scViewPort
   tctab @
   2 tbmhd @ +bmhnPlanes C@ 1- SCALE
   LoadRGB4

   \ Copy picture to display
   tbmap @ 0 0
   CurrentWindow @ +wdRPort @ 0 0
   tbmhd @ +bmhW W@
   tbmhd @ +bmhH W@
   192     \ blitter minterm:$C0=move unchanged
   BltBitMapRastPort

   SIG_CTRL-C ExecWait DROP    \ wait for CTRL-C

   CurrentWindow @ CloseWindow
   CurrentScreen @ CloseScreen
ELSE
  ." Error!" CR
THEN

\ return all the memory

tbmap @ FreeBMap
tbmhd @ FreeBMH
tctab @ FreeCTab
tcamg @ FreeCAMG
tccrt @ FreeCCRT ;
```

•AC•

Basic Directory Service Program

by Bryan D. Catley

Introductory Note: The program described in this article is a revised version of a program (by the same name and author) which received very limited distribution as a "shareware" program. I doubt you have come across it, but if you have, please consider the older version "freeware."

If you use AmigaBASIC from a Command Line Interface (CLI), you must know the frustration of trying to remember the names of the programs you previously saved on disk. At least Workbench users have all those icons to remind them! Sure, you have the "FILES" command, but is that really sufficient? It does the job, but there has got to be a better way!

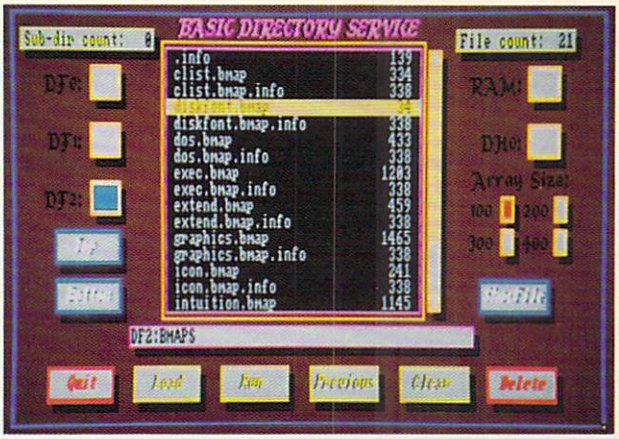
"Basic Directory Service Program" is designed to provide you with the information you need, and the ability to LOAD, RUN, display, and delete selected files. To do this, the program invokes the CLI command LIST, the output of which is directed to the RAM: disk, and then read back by BDSP, sorted, and displayed in alphabetical sequence for the user's review and selection. The only caveat is that BDSP must be invoked from a copy of AmigaBASIC which has been started from a CLI. If it is run from Workbench, your Amiga will "hang," requiring you to re-boot. (This is because CLI commands producing output must have a CLI window to direct it to.)

When you do run BDSP, the screen will blank for a couple of seconds, then the working screen will appear instantly! When you see it, you will realize that BDSP is "gadget" driven (as opposed to "menu driven"). This means every option available to you (and there are quite a few) is selected by "clicking" a gadget.

BDSP Available Options

DF0:, DF1:, DF2:, RAM:, and DH0:, are some of the more obvious gadgets used to specify various devices. Click on a valid (for your system) device gadget, and its root directory will be read, sorted, and displayed. The resulting list may be scrolled up and down by clicking in the scroll bar to the right of the display. (Clicking in the arrowheads will move the list up or down one line at a time.) Move the mouse pointer over the list, and the file/directory names are highlighted. Click on a directory name to read and display that directory path. If you click on a file name you will have "selected" that particular file. The current path is always displayed below the file list. Should you want to go back one level in the current path, just click in the "Previous" gadget. The current directory and file counts are continually displayed in the upper left and right corners of the screen.

Top and Bottom allow you to move the display to the top or bottom of the current list of files and directories.



```
.info                 139
clist.bmap            334
clist.bmap.info       338
diskfont.bmap          34
diskfont.bmap.info    338
dos.bmap              433
dos.bmap.info         338
exec.bmap            1203
exec.bmap.info        338
extend.bmap           459
extend.bmap.info      338
graphics.bmap        1465
graphics.bmap.info    338
icon.bmap             241
icon.bmap.info        338
intuition.bmap       1145
DF2:BMAPS
```

Array Size allows you to specify the size of the internal array which will be used to hold the information from the current directory. The default of 100 should be adequate for most disks, but if you have lots of small programs and/or a hard disk, you may find a higher number more appropriate. (Just remember, you will need additional memory to accommodate the larger array, and will probably need to modify the CLEAR ,30000 statement at the beginning of the program to specify a higher number.)

ShowFile allows you to display the current "selected" file. The display is continuous and wraps around as necessary. When "ShowFile" is selected, a new window opens with a scrolling display, "Cancel", and "Stop/Go" gadgets. Clicking in the "Cancel" gadget terminates the display and returns you to the main screen, while clicking in the "Stop/Go" gadget will (as the name implies) stop or continue the display. If the file selected is binary, not only will the results be unreadable, but the two gadgets will probably also disappear from view! However, they can still be used, and may be selected simply by clicking in the correct space.

(continued)

The remaining gadgets appear across the bottom of the screen in the following order:

Quit terminates BDSP and returns control to AmigaBASIC.

Load loads the selected program, making it ready for editing.

Run will load and run the currently selected program.

Previous causes the parent of the current directory to be read and displayed. Note that while you may advance as many levels as you desire, you may only go back the previous 10 levels.

Clear simply de-selects a currently selected file.

Delete erases the currently selected file after a confirmation request. Remember, if a file has an associated .info file (its icon), that file must also be deleted.

Entering BDSP and Setting Things Up

Type in BDSP as shown in the accompanying BDSP listing, remembering to save a copy every once in a while.

As you type, notice that three system libraries are used: graphics.library, dos.library, and diskfont.library. This means you must make sure the three associated .bmap files are also available at execution time. The first two are stored in the BasicDemos drawer on the EXTRAS disk which you received with your Amiga.

So, if you don't already have it, you must create the third .bmap file (diskfont.bmap). To do this, just type in Listing #2, save it, and run. It will add a diskfont.bmap file to the BasicDemos drawer on your working AmigaBASIC disk. If you choose this approach, you will also need to modify the CHDIR ":BMAPS" statement to CHDIR ":BasicDemos".

Many users have collected all .bmap files and placed them in a separate drawer named BMAPS. If you have not already done so, you should seriously consider it, because many AmigaBASIC programs use the various system libraries. Full sets should be available from any source of Public Domain software, including Amicus disk #8.

Running BDSP

Once you have entered BDSP and saved it, you are ready to run it. You may use any accepted method of executing an AmigaBASIC program EXCEPT executing it from a copy of AmigaBASIC which has been started from the Workbench. I suspect that a popular method will be telling AmigaBASIC to execute BDSP automatically, when it gets started. This is done very simply with the CLI command: "run AmigaBASIC BDSP". (The "run" is optional, and only used if you are multi-tasking AmigaBASIC with other programs.)

Programming Notes

When you run this program you will note the text displays are not typical of AmigaBASIC. You will further note they are all controlled by a number of sub-programs. These sub-programs are all self-contained, may be used in any program, and are fully described in my article "More Basic Text" which appeared in AC V3.2. Specifically, please note the use of the JAM1 mode which allows all of the more interesting effects in the BDSP display.

If you think you may want to use these sub-programs in your own programs, it might be best to enter them first, save them with the ",A" option, then MERGE them into BDSP later.

Please remember that BDSP is a valuable tool in itself, but even if you don't use the CLI (and don't expect to), it may still reveal useful programming techniques which may be advantageous in your own programs. Check it out!

Listing One

```
' Basic Directory Service Program; V3.1.
' Written by Bryan D. Catley and published in
' Amazing Computing magazine.
'
' This is a “freeware” version of a “shareware” program
' of the same name written by the same author.  The earlier
' “shareware” version should now be considered “freeware”.
'
' This program must be run from AmigaBasic which has
' been started from a CLI; or system will hang!
'
' Copyright (C) 1988 by FelineSystems
' February 1988
'
CLEAR ,25000:CLEAR ,30000
DECLARE FUNCTION OpenFont& LIBRARY
DECLARE FUNCTION OpenDiskFont& LIBRARY
DECLARE FUNCTION AskSoftStyle& LIBRARY
DirSize=100:StckPtr=-1:LastRow=144:Gdg1=0:Gdg2=20
Brw=0:Blu=1:Blk=2:Mag=3:Yel=4:Grn=5:Red=6:Gra=7
DispTop=0:x=0:y=0:xlen=0:ylen=0:Pen=0:Pen2=0
q=0:a=0:b=0:c=0:d=0:gdgt=0:oldtop=0:rowtop=0
RecNum=0:HiLite=0:NumRecs=0:Endrec=0:GdgtPtr=0
oldA1=0:oldB1=0:oldA2=526:oldB2=87:FileExists=0
DirCnt=0:FilCnt=0:Limit=0:Ptr1=0:Ptr2=0:RowCnt=0
EOFind=0:standard=0:underline=1:bold=2:italics=4
JAM1=0:JAM2=1:complement=2:inversvid=4
VrtP%=0:lenVBar%=0:offsetp%=0:offset%=0:MouseY%=0
blX%=0:blY%=0:ValidStyles%=255
blX&=0:blY&=0:RP&=0:FontHeight&=8
garnet&=0:topaz&=0:sapphire&=0
FullName$="":str1$="":str2$="":Nm$="":FiName$=""
FPath$="":Sep$="":command$="":RecRead$=""
DIM LineLite%(490),GdgtLite%(300),GdgtInfo%(24,3)
DIM textAttr&(1)
DIM DirList$(DirSize),PathStack$(9)
GOSUB Initialize:HiLite=0

WaitForClick:
WHILE MOUSE(0)=0
  IF HiLite THEN
    x=MOUSE(1):y=MOUSE(2)
    IF x>169 AND x<440 AND y>16 AND y<LastRow THEN
      rowtop=INT(y/8)*8
      IF rowtop<>oldtop THEN
        IF oldtop<>0 THEN PUT(169,oldtop),LineLite%
        PUT(169,rowtop),LineLite%
        oldtop=rowtop
      END IF
    ELSE
```

```
        IF oldtop<>0 THEN PUT(169,oldtop),LineLite%
        oldtop=0:rowtop=0
      END IF
    END IF
  WEND
  GOSUB GetGdgt
  IF gdgt <>0 THEN
    ON gdgt GOTO DoQuit,DoLoad,DoRun,DoPrevious,DoClear
    ON gdgt-5 GOTO DoDelete,DoTop,DoBottom,DoDrive
    ON gdgt-9 GOTO DoDrive,DoDrive,DoDrive,DoDrive
    ON gdgt-13 GOTO DoSize,DoSize,DoSize,DoSize
    ON gdgt-17 GOTO DoUp1,DoSlider,DoDown1,DoShoFile
  END IF
  IF rowtop<>0 AND HiLite THEN
   RecNum=INT((rowtop-15)/8)+DispTop-1
   x=INSTR(DirList$(RecNum)," ")
   IF RIGHT$(DirList$(RecNum),3)<>"Dir" THEN
     FiName$=LEFT$(DirList$(RecNum),x-1)
      HiLite=0
   ELSE
     IF LEN(FPath$)=4 THEN Sep$="" ELSE Sep$="/"
    FPath$=FPath$+Sep$+LEFT$(DirList$(RecNum),x-1)
     FiName$="":GOTO ExecuteList
   END IF
  END IF
  GOTO WaitForClick

  DoQuit:
  IF FileExists THEN KILL "RAM:DIRLIST"
  EndFont garnet&
  EndFont sapphire&
  LIBRARY CLOSE
  WINDOW CLOSE 2:SCREEN CLOSE 2:END

  DoLoad:
  DoRun:
  IF FiName$<>"" THEN
    IF LEN(FPath$)=4 THEN Sep$="" ELSE Sep$="/"
   FullName$=FPath$+Sep$+FiName$
    IF FileExists THEN KILL "RAM:DIRLIST"
    WINDOW CLOSE 2:SCREEN CLOSE 2
    IF gdgt=2 THEN LOAD FullName$ ELSE RUN FullName$
  END IF
  GOTO WaitForClick

  DoPrevious:
  IF StckPtr>1 THEN
    IF oldtop<>0 THEN
      PUT(169,oldtop),LineLite%
      HiLite=-1:oldtop=0:rowtop=0
    END IF
    FiName$=""
   HiLite=-1:StckPtr=StckPtr-2
   FPath$=PathStack$(StckPtr)
   PathStack$(StckPtr+1)=""
    GOTO ExecuteList
  END IF
  GOTO WaitForClick

  DoClear:
  IF FiName$<>"" THEN
    IF oldtop<>0 THEN PUT(169,oldtop),LineLite%
   FiName$="":HiLite=-1:rowtop=0:oldtop=0
  END IF
  GOTO WaitForClick

  DoSize:
  IF oldtop<>0 THEN PUT(169,oldtop),LineLite%
  COLOR ,Gra:LOCATE 20,17:PRINT SPACE$(46)
  IF oldA1<>0 THEN
   LINE(oldA1+2,oldB1+2)-STEP(28,12),Gra,bf
  END IF
  FiName$="":FPath$="":oldA1=0:oldB1=0
  HiLite=0:rowtop=0:oldtop=0:StckPtr=-1
  FOR x=0 TO 9:PathStack$(x)="":NEXT
  LINE(451,25)-STEP(10,108),Gra,bf
  LINE(168,16)-STEP(272,127),Blk,bf
  ERASE DirList$
  IF gdgt=14 THEN DirSize=100
  IF gdgt=15 THEN DirSize=200
  IF gdgt=16 THEN DirSize=300
  IF gdgt=17 THEN DirSize=400
  DIM DirList$(DirSize)
  GOTO WaitForClick

  DoDelete:
  IF FiName$<>"" THEN
    PUT(169,oldtop),LineLite%
    rowtop=0:oldtop=0:HiLite=-1
    LINE(178,28)-STEP(248,78),Mag,b
    LINE(182,32)-STEP(240,70),Yel,bf
    LINE(182,32)-STEP(240,70),Blu,b
    LINE(198,54)-STEP(212,10),Gra,bf
    LINE(198,54)-STEP(212,10),Mag,b
     SetStyle italics
     LOCATE 6,26:COLOR Blu,Yel
     Display"May this file be DELETED?"
    xlen=72:ylen=16:y=74:Pen=Red:Pen2=Brw
     x=204:Nm$="   No":GOSUB DrawGdgt
     IF GdgtInfo%(21,0)=0 THEN
       GdgtInfo%(21,0)=x:GdgtInfo%(21,1)=y
       GdgtInfo%(21,2)=xlen:GdgtInfo%(21,3)=ylen
     END IF
    Pen=Grn:Pen2=Blk
    x=332:Nm$="  Yes":GOSUB DrawGdgt
    IF GdgtInfo%(22,0)=0 THEN
      GdgtInfo%(22,0)=x:GdgtInfo%(22,1)=y
      GdgtInfo%(22,2)=xlen:GdgtInfo%(22,3)=ylen
    END IF
    SetStyle standard
    LOCATE 8,26:COLOR Blk,Gra:PRINT FiName$
0   gdgt=0
    WHILE gdgt=0
      WHILE MOUSE(0)=0:WEND
     Gdg1=21:Gdg2=22:GOSUB GetGdgt:Gdg1=0:Gdg2=20
    WEND
    IF gdgt=23 THEN
```

(continued)

Even up the Score !!!

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```
    IF LEN(FPath$)=4 THEN Sep$="" ELSE Sep$="/"
    FullName$=FPath$+Sep$+FiName$
    command$="DELETE "+FullName$
    CALL Execute&(SADD(command$+CHR$(0)),0,0)
    IF FullName$="RAM:DIRLIST" THEN FileExists=0
    IF RecNum+1<NumRecs THEN
      FOR x=RecNum TO NumRecs-1
        DirList$(x)=DirList$(x+1)
      NEXT
    END IF
    DirList$(NumRecs-1)="":NumRecs=NumRecs-1
    FilCnt=FilCnt-1:GOSUB DispFilCnt
  END IF
  GOTO ShoList
END IF
GOTO WaitForClick

DoTop:
IF HiLite THEN
  IF oldtop<>0 THEN PUT(169,oldtop),LineLite%
  DispTop=1:GOTO ShoList
END IF
GOTO WaitForClick

DoBottom:
IF HiLite THEN
  IF oldtop<>0 THEN PUT(169,oldtop),LineLite%
  DispTop=NumRecs-15
  IF DispTop<1 THEN DispTop=1
  GOTO ShoList
END IF
GOTO WaitForClick

DoDrive:
IF gdgt=9 THEN FPath$="DF0:"
IF gdgt=10 THEN FPath$="RAM:"
IF gdgt=11 THEN FPath$="DF1:"
IF gdgt=12 THEN FPath$="DH0:"
IF gdgt=13 THEN FPath$="DF2:"
FiName$="":StckPtr=-1:HiLite=-1
FOR x=0 TO 9:PathStack$(x)="":NEXT
LINE(451,25)-STEP(10,108),Gra,bf
LINE(168,16)-STEP(272,127),Blk,bf

ExecuteList:
IF LEN(FPath$)=4 THEN Sep$="" ELSE Sep$="/"
COLOR Blk,Gra:LOCATE 20,17
PRINT FPath$;SPACE$(46-LEN(FPath$))
DirCnt=0:FilCnt=0:GOSUB DispDirCnt:GOSUB DispFilCnt
command$="LIST > RAM:DIRLIST "+FPath$+Sep$+FiName$
CALL Execute&(SADD(command$+CHR$(0)),0,0)
IF StckPtr=9 THEN
  FOR x=0 TO 8:PathStack$(x)=PathStack(x+1):NEXT
END IF
IF StckPtr<0 THEN StckPtr=0
PathStack$(StckPtr)=FPath$
IF StckPtr<9 THEN StckPtr=StckPtr+1
OPEN"RAM:DIRLIST" FOR INPUT AS #1
LINE INPUT#1,Nm$
NumRecs=0
WHILE NOT EOF(1) AND NumRecs<=DirSize
  LINE INPUT#1,Nm$
  DirList$(NumRecs)=LEFT$(Nm$,32)
  IF RIGHT$(DirList$(NumRecs),3)="Dir" THEN
    DirCnt=DirCnt+1:GOSUB DispDirCnt
  ELSE
    FilCnt=FilCnt+1:GOSUB DispFilCnt
  END IF
  NumRecs=NumRecs+1
WEND
CLOSE #1:FileExists=-1
IF NumRecs>DirSize THEN
  LINE(168,16)-STEP(272,127),Blk,bf
  LOCATE 4,26:COLOR Red,Blk
  PRINT"Directory Array too Small."
  FiName$="":HiLite=0
  GOTO WaitForClick
END IF
NumRecs=NumRecs-1:DispTop=1
FilCnt=FilCnt-1:GOSUB DispFilCnt
GOSUB SortDirList
IF oldtop<>0 THEN PUT(169,oldtop),LineLite%
oldtop=0:rowtop=0
IF NumRecs<17 THEN
  lenVBar%=108
ELSE
  VrtP%=CINT((16/NumRecs)*100)
  lenVBar%=CINT((110/100)*VrtP%)
  IF lenVBar%>108 THEN lenVBar%=108
END IF
GOTO ShoList

DoUp1:
IF DispTop>1 THEN
  IF oldtop<>0 THEN PUT(169,oldtop),LineLite%
  COLOR Gra,Blk
  DispTop=DispTop-1:GOSUB DrawSlider
  SCROLL(168,16)-(440,143),0,8
  LOCATE 3,1:PRINT TAB(23);DirList$(DispTop-1)
END IF
GOTO WaitForClick

DoSlider:
IF NumRecs>16 THEN
 offset%=MouseY%-23:offsetp%=CINT((offset%/128)*100)
 DispTop=INT((NumRecs/100)*offsetp%)
  IF DispTop<1 THEN DispTop=1
  IF DispTop>NumRecs-15 THEN DispTop=NumRecs-15
END IF
GOTO ShoList

DoDown1:
IF NumRecs>16 AND DispTop+15<NumRecs THEN
  IF oldtop<>0 THEN PUT(169,oldtop),LineLite%
  SCROLL(168,16)-(440,143),0,-8
  COLOR Gra,Blk
  DispTop=DispTop+1
  GOSUB DrawSlider
  LOCATE 18,1:PRINT TAB(23);DirList$(DispTop+14)
END IF
GOTO WaitForClick

DoShoFile:
IF FiName$="" THEN WaitForClick
WINDOW 3,,(120,11)-(520,179),0,2
COLOR ,Gra:CLS:RP&=WINDOW(8)
LINE(0,0)-STEP(399,165),Red,b:LINE(1,1)-STEP(397,163),Red,b
LINE(2,2)-STEP(395,161),Yel,b:LINE(3,3)-STEP(393,159),Yel,b
LINE(4,4)-STEP(391,157),Grn,b:LINE(5,5)-STEP(389,155),Grn,b
LINE(6,6)-STEP(387,153),Blu,b:LINE(7,7)-STEP(385,151),Blu,b
Nm$="S H O W   F I L E"
SetStyle bold+italics:SetMode JAM1
COLOR Mag,Gra:At 130,0:Display Nm$
COLOR Blk,Gra:At 133,0:Display Nm$
SetStyle italics
xlen=72:ylen=16:y=154:Pen=Red:Pen2=Brw
x=44:Nm$=" Cancel":GOSUB DrawGdgt
IF GdgtInfo%(23,0)=0 THEN
 GdgtInfo%(23,0)=x:GdgtInfo%(23,1)=y
 GdgtInfo%(23,2)=xlen:GdgtInfo%(23,3)=ylen
END IF
x=280:Nm$="Stop/Go":Pen=Grn:Pen2=Blk:GOSUB DrawGdgt
IF GdgtInfo%(24,0)=0 THEN
 GdgtInfo%(24,0)=x:GdgtInfo%(24,1)=y
 GdgtInfo%(24,2)=xlen:GdgtInfo%(24,3)=ylen
END IF
SetStyle standard
IF LEN(FPath$)=4 THEN Sep$="" ELSE Sep$="/"
FullName$=FPath$+Sep$+FiName$
OPEN FullName$ FOR INPUT AS #2
Gdg1=23:Gdg2=24:RowCnt=0:EOFind=0
COLOR Blk,Gra
ReadFile:
gdgt=0
WHILE NOT EOF(2) AND gdgt<>24 AND gdgt<>25
  WHILE MOUSE(0)=0 AND NOT EOF(2):GOSUB GetPrint:WEND
  GOSUB GetGdgt
WEND
IF gdgt=24 THEN ShoExit
IF gdgt=0 THEN EOFind=-1
```

```
WaitOnUser:
WHILE MOUSE(0)=0:WEND:GOSUB GetGdgt
IF gdgt=0 OR (EOFind AND gdgt=25) THEN WaitOnUser
IF NOT EOFind AND gdgt=25 THEN ReadFile
GOTO ShoExit

GetPrint:
LINE INPUT#2,RecRead$
IF LEN(RecRead$)<47 THEN
  GOSUB DoList
ELSE
 x=(LEN(RecRead$)/46)+1:Nm$=RecRead$:Limit=(x-1)*46
  FOR n=1 TO Limit STEP 46
   RecRead$=MID$(Nm$,n,46):GOSUB DoList
  NEXT
END IF
RETURN

DoList:
IF RowCnt<18 THEN
  LOCATE RowCnt+2,3:PRINT RecRead$
  RowCnt=RowCnt+1
ELSE
  SCROLL(8,8)-(391,153),0,-8
  LOCATE 19,3:PRINT RecRead$
END IF
RETURN

ShoExit:
Gdg1=0:Gdg2=20
CLOSE #2:WINDOW CLOSE 3
WINDOW 2:RP&=WINDOW(8)
GOTO WaitForClick

ShoList:
LINE(168,16)-STEP(272,127),Blk,bf
IF NumRecs<1 THEN
  LOCATE 4,30:COLOR Red,Blk:PRINT"Directory is Empty"
 LINE(451,25)-STEP(10,108),Gra,bf
  HiLite=0:GOTO WaitForClick
END IF
GOSUB DrawSlider
COLOR Gra,Blk:LOCATE 3,1
FOR x=DispTop-1 TO Endrec-1
  PRINT TAB(23);DirList$(x)
NEXT
GOTO WaitForClick

DrawSlider:
IF NumRecs<17 THEN Endrec=NumRecs ELSE Endrec=DispTop+15
IF Endrec>NumRecs THEN EndRecs=NumRecs
IF NumRecs<17 THEN
  offset%=0
 LastRow=NumRecs*8+16
ELSE
  LastRow=144
  IF DispTop=1 THEN
    offset%=0
  ELSE
    IF DispTop=NumRecs-15 THEN
      offset%=108-lenVBar%
    ELSE
     offsetp%=CINT((DispTop/NumRecs)*100)
     offset%=CINT((110-lenVBar%)/100)*offsetp%
    END IF
  END IF
END IF
LINE(451,25)-STEP(10,108),Gra,bf
LINE(452,25+offset%)-STEP(8,lenVBar%),Yel,bf
RETURN

DispDirCnt:
LOCATE 2,17:COLOR Blk,Gra:PRINT USING "###";DirCnt
RETURN

DispFilCnt:
LOCATE 2,73:COLOR Blk,Gra:PRINT USING "###";FilCnt
RETURN

SortDirList:
LINE(168,16)-STEP(272,127),Blk,bf
LINE(451,25)-STEP(10,108),Gra,bf
COLOR Yel,Blk:LOCATE 4,30:PRINT"Sorting list..."
Limit=1:WHILE Limit<=NumRecs:Limit=Limit*2:WEND
Limit=INT(Limit/2)
WHILE Limit>0
  FOR x=1 TO NumRecs-Limit
    Ptrl=x
    WHILE Ptrl>0
      Ptr2=Ptrl+Limit
     str1$=UCASE$(LEFT$(DirList$(Ptr1-1),20))
     str2$=UCASE$(LEFT$(DirList$(Ptr2-1),20))
      IF str1$>str2$ THEN
        SWAP DirList$(Ptr1-1),DirList$(Ptr2-1)
        Ptr1=Ptr1-Limit
      ELSE
        Ptr1=0
      END IF
    WEND
  NEXT
 Limit=INT(Limit/2)
WEND
RETURN

GetGdgt:
x=MOUSE(1):y=MOUSE(2):gdgt=0
FOR q=Gdg1 TO Gdg2
 a=GdgtInfo%(q,0):b=GdgtInfo%(q,1)
 c=GdgtInfo%(q,2):d=GdgtInfo%(q,3)
  IF x>a AND x<a+c AND y>b AND y<b+d THEN
    gdgt=q+1
    IF gdgt<9 OR gdgt>20 THEN
      PUT(a,b),GdgtLite%
    ELSE
      IF gdgt<18 THEN
        IF gdgt<14 THEN
          IF oldA1<>0 THEN
           LINE(oldA1+2,oldB1+2)-STEP(c-4,d-4),Gra,bf
          END IF
         LINE(a+2,b+2)-STEP(c-4,d-4),Blu,bf
          oldA1=a:oldB1=b
        ELSE
          IF oldA2<>0 THEN
           LINE(oldA2+2,oldB2+2)-STEP(c-4,d-4),Gra,bf
          END IF
         LINE(a+2,b+2)-STEP(c-4,d-4),Red,bf
          oldA2=a:oldB2=b
        END IF
      END IF
    END IF
   q=Gdg2:MouseY%=y
  END IF
NEXT
WHILE MOUSE(0)<>0:WEND
IF (gdgt>0 AND gdgt<9) OR gdgt>20 THEN PUT(a,b),GdgtLite%
RETURN

DrawGdgt:
LINE(x+6,y+4)-STEP(xlen,ylen),Blk,bf
LINE(x,y)-STEP(xlen,ylen),Gra,bf
LINE(x,y)-STEP(xlen,ylen),Pen,b
LINE(x+1,y+1)-STEP(xlen-2,ylen-2),Pen,b
IF Nm$<>"" THEN
  SetMode JAM1
  blX%=x+4:blY%=y+4
  COLOR Pen2,Gra:At blX%,blY%:Display Nm$
  COLOR Pen,Gra:At blX%+2,blY%:Display Nm$
  SetMode JAM2
END IF
IF GdgtPtr<21 THEN
 GdgtInfo%(GdgtPtr,0)=x:GdgtInfo%(GdgtPtr,1)=y
 GdgtInfo%(GdgtPtr,2)=xlen:GdgtInfo%(GdgtPtr,3)=ylen
  GdgtPtr=GdgtPtr+1
END IF
RETURN

Initialize:
CHDIR":BMAPS"
LIBRARY"graphics.library"
LIBRARY"dos.library"
```

(continued)

```
LIBRARY”diskfont.library”
CHDIR”:”
LoadFont”topaz”,8,topaz&
LoadFont”garnet”,9,garnet&
LoadFont”sapphire”,14,sapphire&
SCREEN 2,640,200,3,2:WINDOW 2,,,16,2
FOR x=0 TO 7:PALETTE x,.4,.1,0:NEXT
COLOR Mag,Brw:CLS:RP&=WINDOW(8)
AREA(0,0):AREAFILL
LINE(163,12)-STEP(282,135),Yel,b
LINE(167,15)-STEP(274,129),Mag,b
LINE(168,16)-STEP(272,127),Gra,bf
GET(168,16)-(439,23),LineLite%
LINE(168,16)-STEP(272,127),Blk,bf
GET(168,16)-(240,32),GdgtLite%
LINE(133,155)-(503,164),Blk,bf
LINE(127,151)-(497,160),Gra,bf
LINE(127,151)-(497,160),Mag,b
UseFont garnet&:FontHeight&=9
Nm$=”BASIC DIRECTORY SERVICE”
SetStyle bold+italics
SetMode JAM1
COLOR Blk,Brw:At 177,2:Display Nm$
COLOR Mag,Brw:At 180,2:Display Nm$
UseFont topaz&:FontHeight&=8
SetStyle standard
LINE(12,10)-STEP(147,10),Blk,bf
LINE(6,6)-STEP(147,10),Gra,bf
LINE(6,6)-STEP(147,10),Grn,b
LINE(484,10)-STEP(123,10),Blk,bf
LINE(478,6)-STEP(123,10),Gra,bf
LINE(478,6)-STEP(123,10),Grn,b
Nm$=”Sub-dir count:”
COLOR Grn,Gra:At 8,8:Display Nm$
COLOR Blk,Gra:At 10,8:Display Nm$
Nm$=”File count:”
COLOR Grn,Gra:At 480,8:Display Nm$
COLOR Blk,Gra:At 482,8:Display Nm$
SetMode JAM2:SetStyle italics
xlen=72:ylen=16:y=170:Pen=Red:Pen2=Brw
x=36:Nm$=”  Quit”:GOSUB DrawGdgt
Pen=Grn:Pen2=Blk:x=132:Nm$=”  Load”:GOSUB DrawGdgt
x=228:Nm$=”  Run”:GOSUB DrawGdgt
x=324:Nm$=”Previous”:GOSUB DrawGdgt
x=420:Nm$=” Clear”:GOSUB DrawGdgt
Pen=Red:Pen2=Brw:x=512:Nm$=” Delete”:GOSUB DrawGdgt
y=104:Pen=Blu:Pen2=Yel:x=44:Nm$=”  Top”:GOSUB DrawGdgt
y=128:Nm$=” Bottom”:GOSUB DrawGdgt
y=24:xlen=32:ylen=16:Nm$=””:Pen=Yel
x=84:GOSUB DrawGdgt:x=554:GOSUB DrawGdgt
y=52:x=84:GOSUB DrawGdgt:x=554:GOSUB DrawGdgt
y=80:x=84:GOSUB DrawGdgt
x=526:y=87:xlen=12:ylen=12:GOSUB DrawGdgt
x=582:GOSUB DrawGdgt:x=526:y=103:GOSUB DrawGdgt
x=582:GOSUB DrawGdgt:LINE(528,89)-STEP(8,8),Red,bf
SetStyle standard
UseFont garnet&:FontHeight&=9
COLOR Blk,Brw
At 32,30:PRINT”DF0:”:At 492,30:PRINT”RAM:”
At 36,58:PRINT”DF1:”:At 504,58:PRINT”DH0:”
At 32,86:PRINT”DF2:”
UseFont garnet&:FontHeight&=9
At 495,76:PRINT”Array Size:”
At 494,91:Display”100":At 549,91:Display”200"
At 492,107:Display”300":At 548,107:Display”400"
UseFont topaz&:FontHeight&=8
x=450:xlen=12:Pen=Yel:y=16:ylen=8:GOSUB DrawGdgt
LINE(x,y)-STEP(12,8),Yel,bf:COLOR Gra
AREA(456,17):AREA STEP(-5,6):AREA STEP(10,0):AREAFILL
y=23:ylen=112:GOSUB DrawGdgt
y=135:ylen=8:GOSUB DrawGdgt
LINE(x,y)-STEP(12,8),Yel,bf:COLOR Gra
AREA(451,136):AREA STEP(10,0):AREA STEP(-5,6):AREAFILL
SetStyle italics
x=504:xlen=72:y=128:ylen=16:Pen=Blu:Pen2=Yel
Nm$=”ShowFile”:GOSUB DrawGdgt
SetStyle standard:SetMode JAM1
UseFont sapphire&:FontHeight&=14
Nm$=”Published in Amazing”
COLOR Yel:At 202,20:Display Nm$
COLOR Mag:At 203,20:Display Nm$
Nm$=”Computing magazine.”
COLOR Yel:At 202,36:Display Nm$
COLOR Mag:At 203,36:Display Nm$
At 252,57:Display”Written by:”
UseFont topaz&:FontHeight&=8:SetMode JAM2
COLOR Yel,Blk:LOCATE 10,31:PRINT”Bryan D.  Catley”
LOCATE 11,30:PRINT”2221  Glasgow Road”
LOCATE 12,27:PRINT”Alexandria VA 22307-1819"
COLOR Blu,Blk:LOCATE 13,30:PRINT”Copyright (C) 1987"
LOCATE 14,31:PRINT”by FelineSystems”
SetStyle bold:COLOR Red,Blk
LOCATE 15,24:Display”This program may only  be  run”
LOCATE 16,24:Display”from AmigaBasic started from a”
LOCATE 17,24:Display”CLI!  Select ‘Quit’ if started”
LOCATE 18,31:Display”from  Workbench.”
SetStyle standard
PALETTE 0,.4,.1,0:PALETTE 1,0,0,1
PALETTE 2,0,0,0:PALETTE 3,1,0,1
PALETTE 4,1,1,0:PALETTE 5,0,1,0
PALETTE 6,1,0,0:PALETTE 7,.5,.5,.5
RETURN

SUB SetStyle (style) STATIC
SHARED ValidStyles%
style%=style
CALL SetSoftStyle&(WINDOW(8),style%,ValidStyles%)
END SUB

SUB SetMode (mode) STATIC
mode&=mode
CALL SetDrMd&(WINDOW(8),mode&)
END SUB

SUB At (x%,y%) STATIC
SHARED FontHeight&
x&=x%:y&=y%+INT(FontHeight&*.75)
CALL Move&(WINDOW(8),x&,y&)
END SUB

SUB Display (Txt$) STATIC
CALL Text&(WINDOW(8),SADD(Txt$),LEN(Txt$))
END SUB

SUB LoadFont (FontName$,FontHeight%,FontPtr&) STATIC
SHARED FontHeight&,textAttr&()
FontHeight&=FontHeight%
textAttr&(0)=SADD(FontName$+”.font”+CHR$(0))
textAttr&(1)=FontHeight&*65536&
IF (FontName$=”topaz”) AND (FontHeight%=8 OR FontHeight%=9) THEN
 FontPtr&=OpenFont&(VARPTR(textAttr&(0)))
ELSE
 FontPtr&=OpenDiskFont&(VARPTR(textAttr&(0)))
END IF
END SUB

SUB UseFont (FontPtr&) STATIC
SHARED ValidStyles%
CALL SetFont&(WINDOW(8),FontPtr&)
ValidStyles%=AskSoftStyle&(WINDOW(8))
END SUB

SUB EndFont (FontPtr&) STATIC
CALL CloseFont&(FontPtr&)
END SUB
```

Listing Two

```
' Listing #2 - diskfont.bmap maker
' ‘BDSP’ by Bryan D. Catley
PRINT”diskfont.bmap maker starting”
x$=”OpenDiskFont”+CHR$(0)
x$=x$+CHR$(255)+CHR$(226)+CHR$(9)+CHR$(0)
x$=x$+”AvailFonts”+CHR$(0)
x$=x$+CHR$(255)+CHR$(220)+CHR$(9)+CHR$(1)+CHR$(2)+CHR$(0)
OPEN”BasicDemos/diskfont.bmap” FOR OUTPUT AS #1
PRINT#1,x$;
CLOSE#1
PRINT”diskfont.bmap maker ending”
END
```

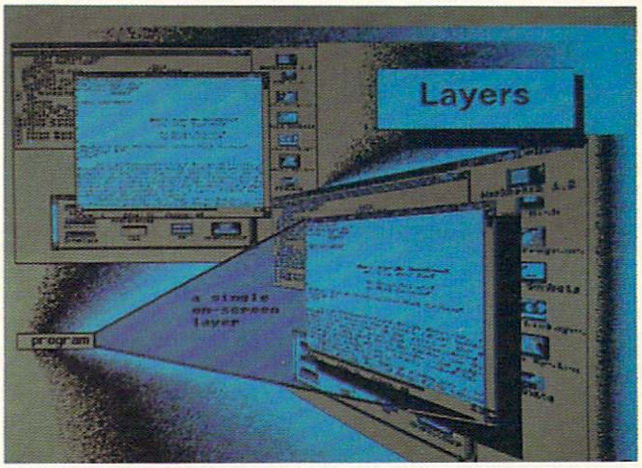
•AC•

Don't Give Me ZeroZero or, Clip Your Own

by Mark Cashman

In a performance-related design decision, it was decided that Intuition would render (draw) borders and gadgets in the same layer of the screen as the window. Because this meant that ill-considered drawing within the window could trash the border, the GimmeZeroZero window was provided. In GimmeZeroZero, borders and gadgets are rendered into another larger layer, linked to and underneath the window layer.

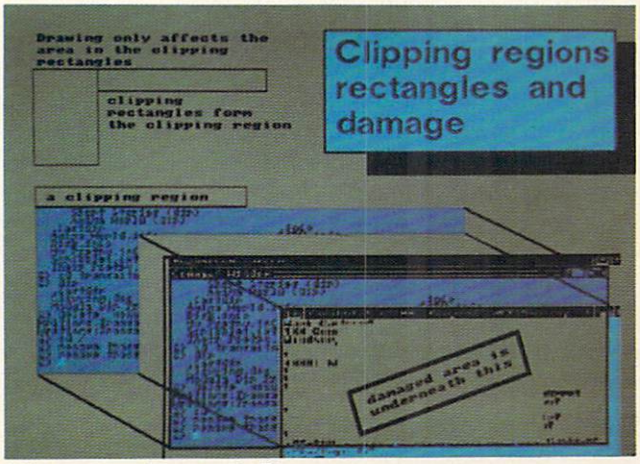
Unfortunately, this type of window has a terrible performance penalty. Users of AmigaBASIC (which uses at least two GimmeZeroZero windows) are probably familiar with the extremely slow updates to newly uncovered window areas. Not only does the GimmeZeroZero window have a slow refresh rate, it also refreshes the other windows at a snail's pace.



One On-Screen Layer

One alternative is user software clipping, arranging your program so you just don't draw past the borders of the window. However, there are many situations where it wouldn't be practical to control drawing to this extent. For instance, imagine a line described by two endpoints. One endpoint is inside the window, the other outside. A complex procedure must be used to clip the line to the inside edge of the window border. Polylines (lines linked end-to-end and going in many directions) are even more difficult to deal with, since they require multiple applications of the line clipping procedure.

Fortunately, the Amiga Graphics Library and Layers Library provide facilities called clipping regions, which allow you to do your own clipping without the overhead of a GimmeZeroZero window or application-dependent clipping routines scattered all over the program.

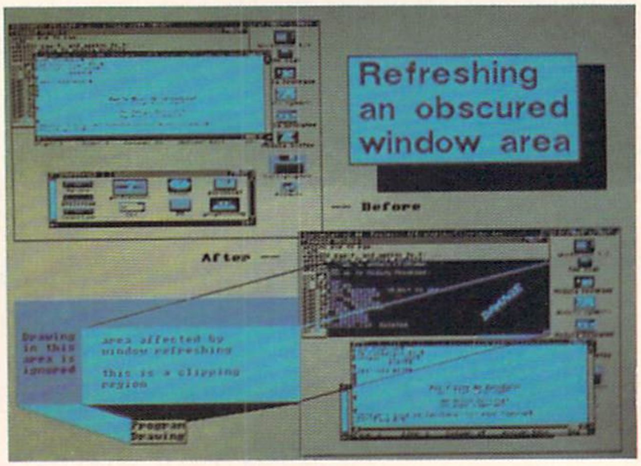

Drawing only affects the area in the clipping rectangles
clipping rectangles form the clipping region
Clipping regions rectangles and damage
a clipping region
damaged area is underneath this

Clipping Rect & Damage

Intuition uses clipping regions to update newly uncovered portions of simple refresh windows. The regions cause the system to ignore drawing instructions outside of the boundaries of one or more clipping rectangles. (Clustered together, these clipping rectangles form a clipping region.)

When linked to the window Layer structure, clipping regions allow the damage list for a simple refresh window (a window where obscured areas must be redrawn by the

(continued)


Refreshing an obscured window area
— Before
After —
Drawing in this area is ignored
area affected by window refreshing
this is a clipping region
Program Drawing

Damage Before & After

application) to keep track of the covered areas of a window. When the window is being refreshed by the application program, the only areas where drawing actually occurs are those which have just been revealed. Thus, even though the application may issue drawing operations on sections of the window outside the clipping region, these operations are not performed. This allows extremely fast window updates, because drawing operations that are not performed have only a minimal cost—the cost of checking whether or not a pixel is within the clipping region.

The smart refresh window uses a similar strategy for updates. However, the source of the updates is not the application program, but the Layers Library routines. The routines divert drawing operations from obscured sections of a window to an off-screen backup area. When an area of the window is revealed, the system detects it and copies the appropriate portion of the off-screen area into the on-screen portion of the window using a damage list for clipping.

The program below replaces the system-defined damage list with a user-defined damage list (a clipping region which clips everything past the inside edge of the window border). The strategy used works well, with no modification, on simple and smart refresh windows.

The program uses the smart refresh window type. You will see that with the smart refresh window, the clipping region affects the on-screen portion of the window, and the backup areas. In other words, your drawing is not only clipped into the window, but also backed up into the off-screen areas. When the window is revealed, notice that the entire window contains the drawing, properly clipped by our user-defined damage list.

I hadn't expected that, but it worked.

The following is an outline of the program:

The libraries—Intuition, Layers, and Graphics—are opened.

The window is opened.

The region is created, initially containing no clipping rectangles.

The clipping rectangle is created and added to the region.

The region is used to replace the damage list.

Drawing is performed, enclosed in the BeginRefresh and EndRefresh calls, which bring the fake damage list into play.

The original damage list is replaced.

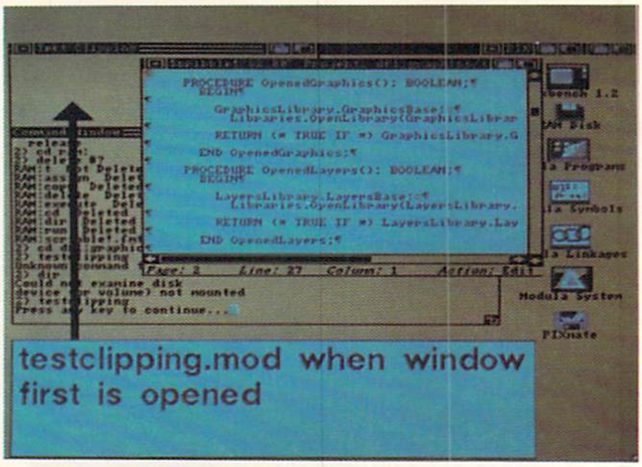
The region is disposed of.

The window is closed.

Memory is released and the libraries are closed.

When creating this program, I came across several areas where documented features did not work as I expected.

For instance, the Amiga *ROM Kernel Manual* states that "DisposeRegion() is provided to return the [Region] memory to the system when you have finished with it. Not only is the region structure deallocated, but also any rectangles that have been linked into it." Unfortunately, this is not true. During testing, I found that each time I ran the program, an additional 8 bytes were not deallocated. Since this was exactly the size of the Rectangle structure, and I had just one Rectangle in the Region, it had to be the Rectangle which was causing me to lose the 8 bytes. Once I had linked the Rectangle into my Remember list (which allows me to release all allocated memory at one time), the amount of memory in the system before and after the program run was the same.



```
PROCEDURE OpenedGraphics(): BOOLEAN;¶
  BEGIN¶
    GraphicsLibrary.GraphicsBase:=¶
      Libraries.OpenLibrary(GraphicsLibrar
    RETURN (* TRUE IF *) GraphicsLibrary.G
  END OpenedGraphics;¶
PROCEDURE OpenedLayers(): BOOLEAN;¶
  BEGIN¶
    LayersLibrary.LayersBase:=¶
      Libraries.OpenLibrary(LayersLibrary.
    RETURN (* TRUE IF *) LayersLibrary.Lay
  END OpenedLayers;¶
Page: 2      Line: 27     Column: 1      Action: Edit
```

Pre-Clipping Drawing

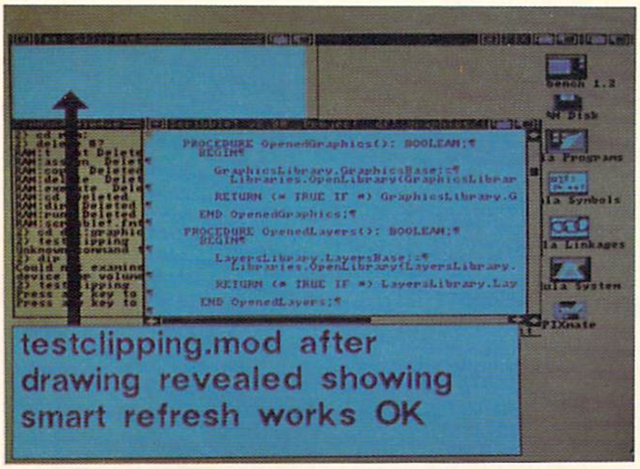
In its original form, the program simply opened the window, established and linked the clipping region into the layer, drew the lines, and waited for CloseWindow. Then, I wondered if the technique would work if there were other windows overlapping. So I set up the program to push the window to the background, which guaranteed it would be partly covered.

This caused some strange behavior. The window appeared, was drawn into, and then went to the background. Yet the *Amiga Programmer's Handbook* (Mortimore's book from Sybex) states "When the WindowToBack function returns, a specific window will be moved behind all other windows in the same screen..."

The Intuition manual is more specific. If I had checked, it would have saved me some trouble in understanding what was happening: "This routine sends a request to Intuition asking to send the window in back of all of the other windows on the screen. Note, the Window will not be depth-arranged immediately, but rather will be arranged the next time Intuition receives an input event, which happens currently at a minimum rate of ten and a maximum of sixty times per second."

This incident showed me the importance of having and referencing multiple sources about any particular feature.

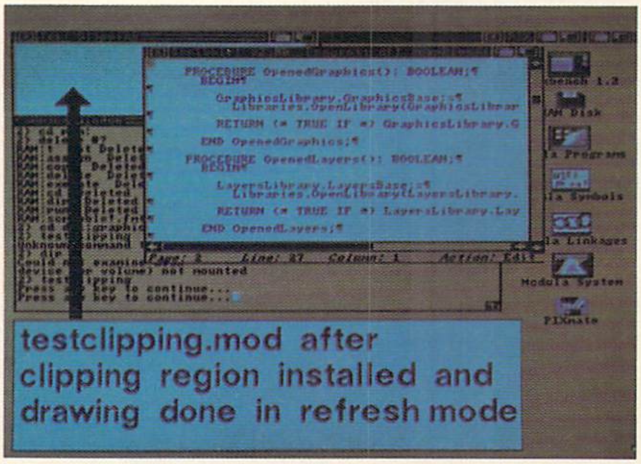
The problem I had was also a failure to take multitasking into account. I assumed an operation would be complete when control returned from a system routine, but in a message-passing operating system, things can be much more loosely coupled than that. In this case, the graphics library operations were so fast, Intuition didn't have time to respond before they took action. In a situation of testing for unexpected system side effects, this was a problem. When programming an application, one would not normally plan for any specific window layering. Whether or not a window was concealed during rendering (drawing) would be of no concern.



```
PROCEDURE OpenedGraphics(): BOOLEAN;¶
  BEGIN¶
    GraphicsLibrary.GraphicsBase:=¶
      Libraries.OpenLibrary(GraphicsLibrar
    RETURN (* TRUE IF *) GraphicsLibrary.G
  END OpenedGraphics;¶
PROCEDURE OpenedLayers(): BOOLEAN;¶
  BEGIN¶
    LayersLibrary.LayersBase:=¶
      Libraries.OpenLibrary(LayersLibrary.
    RETURN (* TRUE IF *) LayersLibrary.Lay
  END OpenedLayers;¶
```

testclipping.mod after drawing revealed showing smart refresh works OK

Post-Clipping Drawing



```
PROCEDURE OpenedGraphics(): BOOLEAN;¶
  BEGIN¶
    GraphicsLibrary.GraphicsBase:=¶
      Libraries.OpenLibrary(GraphicsLibrar
    RETURN (* TRUE IF *) GraphicsLibrary.G
  END OpenedGraphics;¶
PROCEDURE OpenedLayers(): BOOLEAN;¶
  BEGIN¶
    LayersLibrary.LayersBase:=¶
      Libraries.OpenLibrary(LayersLibrary.
    RETURN (* TRUE IF *) LayersLibrary.Lay
  END OpenedLayers;¶
Page: 1     Line: 37     Column: 1          Action: Edit
```

testclipping.mod after clipping region installed and drawing done in refresh mode

Post-Clip Drawing Shown

This program also shows the many techniques that must be mastered to write Amiga programs—opening and closing libraries and windows, dynamically allocating memory and linking it into a Remember list (to be freed en masse at program termination), and performing a series of structure initializations and system calls. Error and exception handling are difficult, but important—especially with the requirement to free allocated resources carefully when a problem occurs.

The program is written in Modula-2, using the TDI library modules. C programmers should know that a Modula-2 program must be read from bottom to top. The bottom section of the program corresponds to the C main() function, and procedures called by the main section are above it. The general rule in Modula-2 is, anything used must be declared earlier in the program.

A few notes on my programming standards:

Imported identifiers are always qualified by module name.

Comments indicate special situations, counter-intuitive concepts, or bugs encountered in development.

Procedures are named to define the purpose of their code, reducing the need for comments.

Procedures are sometimes nested (this is not allowed in languages like C or BASIC) to provide additional detail.

Variables are declared in alphabetical order.

All names are long enough (except in the case of those inherited from library modules) to ensure the purpose or content of the named object is clear. TYPE definition identifiers are ended with TYPE to clearly indicate the difference between type identifiers and variables.

(continued)

$$I_0 = \sqrt{\frac{\omega}{2\pi}\int_0^{2\pi/\omega}\left(\frac{1}{2}+\frac{1}{2}\cos(2\omega t - 2\theta)\right)dt}$$

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```
MODULE TestClipping;

  (* Test use of clipping regions. Mark Cashman 12/1/87
     See module initialization for details. *)

  IMPORT

    AMIGAX,
    GraphicsLibrary,
    InOut,
    Intuition,
    LayersLibrary,
    Libraries,
    Memory,
    Pens,
    Ports,
    Regions,
    Screens,
    Strings,
    SYSTEM,
    Windows,
    WindowService

      (* ^ This is one of my own modules - not included
         See the note where it is used. *);

  VAR

    Anything:
      CHAR;

    ClippingRectanglePtr:
      GraphicsLibrary.RectanglePtr;

    ClippingRegionPtr:
      Regions.RegionPtr;

    OldClippingRegionPtr:
      Regions.RegionPtr;

    RememberPtr:
      Intuition.RememberPtr;

    WindowPtr:
      Intuition.WindowPtr;

  PROCEDURE AbortManager;

     (* CAUTION: This has not been tested. All of my errors
                 in developing this program crashed the
                 system (they were too serious for this
                 routine. However, this is all pretty
                 standard. *)

    BEGIN

      IF WindowPtr # SYSTEM.NULL THEN
        Windows.CloseWindow(WindowPtr);
      END;

      IF RememberPtr # SYSTEM.NULL THEN
        Intuition.FreeRemember(RememberPtr,TRUE);
      END;

      CloseLibraries;

      HALT;

    END AbortManager;

  PROCEDURE PrepareForAbnormalTermination;
    BEGIN

      RememberPtr:=            SYSTEM.NULL;
      WindowPtr:=              SYSTEM.NULL;

      AMIGAX.ErrorProcessor:=
        AbortManager;

    END PrepareForAbnormalTermination;

  PROCEDURE OpenedLibraries(): BOOLEAN;

    PROCEDURE OpenedGraphics(): BOOLEAN;
      BEGIN

        GraphicsLibrary.GraphicsBase:=
          Libraries.OpenLibrary
            (GraphicsLibrary.GraphicsName,0);

        RETURN (* TRUE IF *)
          GraphicsLibrary.GraphicsBase # SYSTEM.NULL;

      END OpenedGraphics;

    PROCEDURE OpenedLayers(): BOOLEAN;
      BEGIN

        LayersLibrary.LayersBase:=
          Libraries.OpenLibrary
            (LayersLibrary.LayersName,0);

        RETURN (* TRUE IF *)
          LayersLibrary.LayersBase # SYSTEM.NULL;

      END OpenedLayers;

    PROCEDURE OpenedIntuition(): BOOLEAN;
      BEGIN

        Intuition.IntuitionBase:=
          Libraries.OpenLibrary(Intuition.IntuitionName,0);

        RETURN (* TRUE IF *)
          Intuition.IntuitionBase # SYSTEM.NULL;
    END OpenedIntuition;

  BEGIN

    RETURN (* TRUE IF *)

      OpenedGraphics()     AND
      OpenedLayers()       AND
      OpenedIntuition();

  END OpenedLibraries;

PROCEDURE OpenedWindow

  (VAR WindowPtr: Intuition.WindowPtr):

    BOOLEAN;

  VAR

    NewWindow:
      Intuition.NewWindow;

  PROCEDURE InitializedNewWindow(): BOOLEAN;

    PROCEDURE AllocatedAndLoadedNewWindowTitleMemory():

        BOOLEAN;

      TYPE

        TitleTYPE =
          ARRAY [0..255] OF CHAR;

        TitlePtrTYPE =
          POINTER TO TitleTYPE;

      VAR

        TitlePtr:
          TitlePtrTYPE;

      BEGIN

        NewWindow.Title:=
          Intuition.AllocRemember
            (RememberPtr,
             SYSTEM.TSIZE(TitleTYPE),
             Memory.MemReqSet{Memory.MemClear});

        IF NewWindow.Title = SYSTEM.NULL
          THEN RETURN FALSE; END;

        TitlePtr:= TitlePtrTYPE(NewWindow.Title);

        Strings.Assign(TitlePtr^,"Test Clipping");

        RETURN TRUE;

      END AllocatedAndLoadedNewWindowTitleMemory;

    PROCEDURE InitializeNewWindowStructure;

      CONST

        SimpleRefresh = Intuition.Refresh0;
        UseScreen =     SYSTEM.BYTE(-1);

      BEGIN

        WITH NewWindow DO

          TopEdge:=  0;
          LeftEdge:= 0;
          Width:=  320;
          Height:= 100;

          DetailPen:= UseScreen;
          BlockPen:=  UseScreen;

          IDCMPFlags:=
            Intuition.IDCMPFlagSet
              {Intuition.CloseWindowFlag};

          Flags:=
            Intuition.WindowFlagSet
              {Intuition.WindowSizing,
               Intuition.WindowDrag,
               Intuition.WindowDepth,
               Intuition.WindowClose
               (* Note -
                a simple refresh window is not required;
                this works on smart refresh as well as
                simple *)};

          FirstGadget:= SYSTEM.NULL;
          CheckMark:=   SYSTEM.NULL;
          Screen:=      SYSTEM.NULL;
          BitMap:=      SYSTEM.NULL;

          MinWidth:=    10;
          MinHeight:=   10;
          MaxWidth:=    640;
          MaxHeight:=   200;

          Type:=
           Intuition.ScreenFlagSet
             {Intuition.WBenchScreen};

        END;

      END InitializeNewWindowStructure;

    BEGIN

      IF AllocatedAndLoadedNewWindowTitleMemory() THEN
```

(continued)

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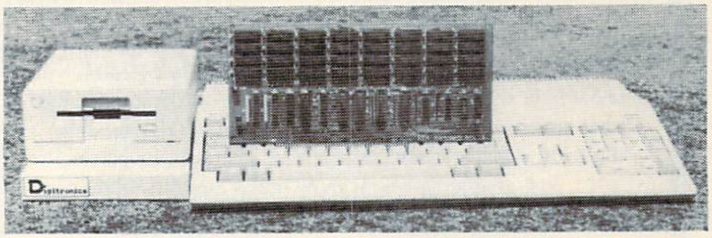

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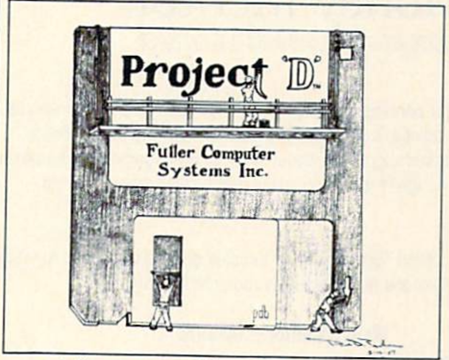
```
        InitializeNewWindowStructure;

        RETURN TRUE;

      ELSE

        RETURN FALSE;

      END;

    END InitializedNewWindow;

  BEGIN

    IF InitializedNewWindow() THEN

      WindowPtr:= Windows.OpenWindow(NewWindow);

      RETURN (* TRUE IF *) WindowPtr # SYSTEM.NULL;

    ELSE

      RETURN FALSE;

    END;

  END OpenedWindow;

PROCEDURE AllocatedClippingRectangle

  (VAR ClippingRectanglePtr:
         GraphicsLibrary.RectanglePtr):

    BOOLEAN;

  BEGIN

     (* NOTE:
        This is supposed to be deallocated by
        DisposeRegion. It isn't, so it has to be recorded
        in the memory list. *)

     ClippingRectanglePtr:=
       GraphicsLibrary.RectanglePtr
         (Intuition.AllocRemember
           (RememberPtr,
            SYSTEM.TSIZE(GraphicsLibrary.Rectangle),
            Memory.MemReqSet{Memory.MemClear}));

     IF ClippingRectanglePtr = SYSTEM.NULL
       THEN RETURN FALSE; END;

     WITH ClippingRectanglePtr^ DO

       MinX:= INTEGER(WindowPtr^.BorderLeft);
       MinY:= INTEGER(WindowPtr^.BorderTop);

       (* The next two statements use procedures from my
          module WindowService. The meaning of the
          procedures should be self-explanatory. *)

      MaxX:=
        MinX +
          INTEGER
            (WindowService.WidthExcludingBorders
              (WindowPtr));

      MaxY:=
        MinY +
        INTEGER
          (WindowService.HeightExcludingBorders
              (WindowPtr));

    END;

    RETURN TRUE;

  END AllocatedClippingRectangle;

PROCEDURE AllocatedClippingRegion

  (VAR ClippingRegionPtr: Regions.RegionPtr):

    BOOLEAN;

  BEGIN

    ClippingRegionPtr:= Regions.NewRegion();
    RETURN (* TRUE IF *) ClippingRegionPtr # SYSTEM.NULL;

  END AllocatedClippingRegion;

PROCEDURE SetNewRegionToIncludeNewClippingRectangle;
  BEGIN

    Regions.OrRectRegion
      (ClippingRegionPtr^,ClippingRectanglePtr^);

  END SetNewRegionToIncludeNewClippingRectangle;

PROCEDURE ExchangeNewClippingRegionWithWindowDamageList;

  VAR

    LayerPtr:
      LayersLibrary.LayerPtr
        (* Required because WindowPtr^.RPort^.layer
          is a SYSTEM.ADDRESS, not a LayerPtr, in
          the RastPort definition. *);

  BEGIN

    LayerPtr:=
      LayersLibrary.LayerPtr(WindowPtr^.RPort^.layer);

    OldClippingRegionPtr:= LayerPtr^.DamageList;
```

INTRODUCING.....



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```
    LayerPtr^.DamageList:= ClippingRegionPtr;

  END ExchangeNewClippingRegionWithWindowDamageList;

PROCEDURE DrawLinesAcrossWindowFromEdgeToEdge;

  VAR

    x:
      CARDINAL;

  BEGIN

    (* If we weren't clipping, this would destroy the
       window borders *)

    Windows.BeginRefresh(WindowPtr);

    WITH WindowPtr^ DO

      FOR x:= 0 TO Width DO
        (* Draw lines across clipping rectangle to see it
           work *)
        Pens.Draw(RPort,x,0);
        Pens.Draw(RPort,x,Height);
      END;

    END;

    Windows.EndRefresh(WindowPtr,TRUE);

  END DrawLinesAcrossWindowFromEdgeToEdge;

PROCEDURE ReplaceWindowRealDamageList;

  VAR

    LayerPtr:
      LayersLibrary.LayerPtr
        (* Required because WindowPtr^.RPort^.layer
           is a SYSTEM.ADDRESS, not a LayerPtr, in
           the RastPort definition. *);

  BEGIN

    LayerPtr:=
      LayersLibrary.LayerPtr(WindowPtr^.RPort^.layer);

    LayerPtr^.DamageList:= OldClippingRegionPtr;

  END ReplaceWindowRealDamageList;

PROCEDURE WaitForCloseWindowMessage;

  VAR

    MessagePtr:

      (* This record allows the pointer to be considered
         to point to either a normal Exec message or an
         Intuition IntuiMessage. See Wirth's Modula text,
         or Miller & Kaplan's "Modula-2 Programming"
         for more details. *)

      RECORD
        CASE Type: BOOLEAN OF
          TRUE:  Normal:       Ports.MessagePtr |
          FALSE: IntuiMessage: Intuition.IntuiMessagePtr
        END;
      END;

  BEGIN

    LOOP

      MessagePtr.Normal:=
        Ports.WaitPort(WindowPtr^.UserPort);

      MessagePtr.Normal:=
        Ports.GetMsg(WindowPtr^.UserPort);

      IF Intuition.CloseWindowFlag IN
        MessagePtr.IntuiMessage^.Class
      THEN
        Ports.ReplyMsg(MessagePtr.Normal);
        EXIT;
      END;

      Ports.ReplyMsg(MessagePtr.Normal);

    END;

  END WaitForCloseWindowMessage;

PROCEDURE CloseLibraries;
  BEGIN

    Libraries.CloseLibrary(Intuition.IntuitionBase);
    Libraries.CloseLibrary(LayersLibrary.LayersBase);
    Libraries.CloseLibrary(GraphicsLibrary.GraphicsBase);

  END CloseLibraries;

BEGIN

  (*

        This program demonstrates how to use a clipping region
to restrict drawing to within the window borders.

        This is the same as a GimmeZeroZero window but much
more efficient.
Also more bookkeeping on your part. The clipping region you
create is substituted for the window "damage list", which is
normally used by a simple
refresh window to make the redrawing of uncovered parts of the
window very efficient.
```

(continued)

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```
        When using the procedure shown in this program in a
realistic application, you probably would create your clipping
region at the start of your program (remember to update it as
the window is resized), and link it to the window only when
about to draw. Remember to unlink it immediately, so as not to
interfere with actual refreshing required when obscured
portions of the window are revealed.

        CAUTION: This has not been used in an active multi-
tasking environment. You may need to LockLayers and UnlockLay-
ers if windows may be being resized, moved, or depth arranged
during the application of the technique shown in this program.

        NOTE: Of course, you can use this technique to create
odd sizes or shapes of clipping regions, as well as the
orthodox "just-within-the-borders" shape I've demonstrated
here.

        NOTE: I thought the 1.2 function InstallClipRegion
would handle inserting the region into the window. I went to
the Guru every time on that one.

        Please let me know if you find out anything about this
program I haven't mentioned. I can be reached at cmar on BIX,
or at 130 Conestoga St., Windsor, CT 06095 USA.

        Mark Cashman
        12/1/87

    *)

  PrepareForAbnormalTermination (* Just in case *);

  IF OpenedLibraries() THEN

    IF OpenedWindow(WindowPtr) THEN

      Windows.WindowToBack(WindowPtr);

      (* The next two statements are required in order to
         give the window enough time to reach the back
         before drawing begins. Apparently, WindowToBack
         returns before the window is moved, because if
         these two statements are omitted, then
         the drawing takes place while the window is
         still at the front, and the window doesn't move
         to the back until the drawing is finished.

         For testing this program, these statements can
         give you time enough to move windows around to
         obscure all or part of this program's window. If
         you do this, you can see for yourself that
         this clipping technique works even when parts of
         the window are obscured.

         In this version of the program, the window is a
         smart refresh window. After the drawing has been
         done, if the window was obscured, and you reveal
         the obscured parts, you can see that the
         clipping and drawing affected all portions
        of the window.

         If you add the simple refresh flag to the
         NewWindow.Flags then only the visible portion of
         the window is updated with the drawing. The
         clipping still works fine.

      *)

      InOut.WriteString
        ("WindowToBack - Press any key to continue...");

      InOut.Read(Anything);

      IF

        AllocatedClippingRectangle(ClippingRectanglePtr)

      THEN

        IF

          AllocatedClippingRegion(ClippingRegionPtr)

        THEN

          SetNewRegionToIncludeNewClippingRectangle;
          ExchangeNewClippingRegionWithWindowDamageList;

          DrawLinesAcrossWindowFromEdgeToEdge
            (* Won't trash borders *);

          ReplaceWindowRealDamageList;

          InOut.WriteString("WindowToFront - Press");
          InOut.WriteString("any key to continue...");

         InOut.Read(Anything);

         Windows.WindowToFront(WindowPtr);

         WaitForCloseWindowMessage;

        END;

        Regions.DisposeRegion(ClippingRegionPtr^);
      END;

      Windows.CloseWindow(WindowPtr);
    END;

    CloseLibraries;
  END;

  Intuition.FreeRemember(RememberPtr,TRUE);
END TestClipping.
```

•AC•

Roomers

by The Bandito

The Bandito has the inside scoop on one of the most exciting stories to hit Amigadom since the Amiga 1000 debuted — the first public showing of the Amiga 3000. The Amiga 3000 was shown at the San Diego Amiga User's Group meeting in April by a group of Commodore International engineers. They were in San Diego for a special presentation to General Dynamics (or so they told the rapt audience), and found themselves with a few hours to kill before their plane left for Europe. So they dropped into the SDAUG meeting to show off their baby, the Amiga 3000.

The Amiga 3000 is powered by a 68020, with new Denise and Agnus chips for incredibly high resolution performance. The case was pasted with FCC stickers proclaiming it a prototype model not licensed for sale. The engineers opened their demo with a new screen asking for the Workbench disk—a ray-traced, three-dimensional hand in hundreds of colors, holding a disk and rotating around the screen.

Jaws dropped as the team of European engineers ran the machine through its paces, as they showed off the redesigned 640 x 400 noninterlaced Workbench 2.0 screen and high resolution ray-traced pictures in hundreds of colors. Several animation demos were also shown. Unfortunately, the engineers had to run to catch their plane, so they weren't able to stick around and answer questions.

A reporter from *AmigaView* magazine was there to cover the whole event in complete detail.

Excited Amiga fans rushed to post the news on bulletin boards, and the rumors spread like wildfire. Debate about the machine's new features raged on UseNet, BIX, and Compuserve.

Consternation reigned at Commodore when the rumors filtered back to them. Who were these guys? Who authorized them to show this machine? What presentation for General Dynamics? There was a great deal of arm-waving, finger-pointing, and handwringing at Westchester, and phone lines hummed with frantic calls from across the Atlantic. No, nobody in Europe knew anything about this.

Who was responsible, then? Dale Luck, ace Amiga specialist and architect of Kickstart 1.3, was called in to find out what happened. Some shrewd investigative work followed, and now the whole story can be told. Remember the Bandito said that this was the *April* meeting? That's right, it was a hoax, and a beautifully executed one, too.

The masterminds behind this coup were Steve Hartford, president of SDAUG, Mark Randall, president of the LA Amiga User's Group, and Jerry Humphrey. These jokers took a Mac II motherboard, put it in an Amiga 2000 case, and stuck them on a Mac II monitor. They even had some "Amiga 3000" labels typeset and stuck them on the case for authenticity. They used some Mac programs to generate realistic simulations of Amiga software, including the Workbench. Then they did their little show, which the San Diego users bought hook, line, and fishing pole, as did Commodore (for a while). Jerry Humphrey pretended to be from the nonexistent *AmigaView* magazine, and he even asked the audience if they'd heard of him (20 people raised their hands).

The hoaxsters started into their act and explained they were there to show the computer to General Dynamics. It looked like the jig was up when someone in the audience said they were from General Dynamics! However, he went on to say that he thought he'd seen the "engineers" at GD that day, and from then on, the audience was convinced. Well, it certainly was fun, though the Bandito doesn't think Commodore sees it quite that way. Bravo for a hoax well done. Let's just hope the *real* Amiga 3000 comes out soon, so the pranksters won't have to do this again next year.

The Bandito was present at a very special event—Max Toy, president of Commodore, spoke at the First Amiga User's Group (FAUG) meeting in April. The Bandito had heard that FAUG was the biggest Amiga user group in the world, but this meeting was amazing even by those standards. Well over 800 people were in attendance, maybe a thousand. It was standing room only at the Palo Alto Hyatt. Some of the celebrities in the audience included Dan Silva (author of DeluxePaint) and Jay Miner (designer of the Amiga). Esther Appleton from Micro-Systems Software talked about their new word processor Excellence going head-to-head with WordPerfect; Tim Jenison from NewTek introduced

(continued)

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Digi-View 3.0 software with overscan and extra halfbrite support to the admiring crowd; then Max Toy captivated the audience for more than two hours, answering numerous questions.

Max said that things are going great—the stock just reached his option price (remember, he came on board just days before the October 19th stock market crash). Sales are good on the C64, MS-DOS, and Amiga lines, and the company has shown a profit for 7 quarters in a row. Things are great in Europe—they're even selling Amiga 500's in German grocery stores. Unfortunately, there was little else in the way of hard information forthcoming. Yes, Commodore is working on new machines, but no word of exactly what or exactly when. But the crowd loved it anyway. Afterward, Max left with about 30 FAUG members to go for pizza at Frankie, Johnny, and Luigi's in Mountain View (if you're interested, Max had a combination pizza, which kind of goes along with Commodore's product line, if you think about it). All in all, it was a successful PR event for Commodore. Wouldn't it be nice if they could do the right thing in PR more often?

Speaking of FAUG, is it true that *Commodore* magazine is interested in buying FAUG's magazine *Robo City News*? The Bandito's spies report secret discussions. RCN could be folded into Commodore's new Amiga magazine, if the deal pans out.

Commodore and Microsoft are engaged in some high-level negotiations about Word, Excel, and other hot Microsoft titles being ported to the Amiga. Commodore wants the legitimacy of the Microsoft name on Amiga products. Microsoft is being coy, but admits to some interest after WordPerfect's success on the Amiga. We could also see Microsoft Unix or even OS/2 on Amigas in the future (heaven forbid!) The Bandito will tell you more just as soon as he pastes together these shredded documents found in a Westchester dumpster.

Well, Amiga Live!, following in Digi-View's footsteps, has announced a software upgrade to add overscan "real soon now." However, the Bandito heard that overscan slows down the snail-like frame rate of Live! even further.

Yes, it's true. PhotonPaint's author, Ori Pelli, has been drafted by the Israeli army, and that's not good news for those awaiting PhotonPaint II. It looks like Digi-Paint II and Deluxe PhotoLab will beat PhotonPaint II to market by a few years. Oh well, perhaps Ori will have enough time to squash a few of the larger arthropods that lurk in the crevices of PhotonPaint before he heads off to the West Bank. By the way, it looks like the other contenders in the HAM Paint Wars won't arrive till the summertime. Deluxe PhotoLab increased its price to $139, while Digi-Paint II has had more features added (final price will be "well under $100"). What happened to DeluxePaint in all of this? We may never see DeluxePaint III, the Bandito hears, because Deluxe PhotoLab is confusing the issue at EA.

While on the West Coast for the FAUG meeting, the Bandito stopped in at the 13th West Coast Computer Faire. Sad to tell, there wasn't much Amiga action. A couple of dealers, a stray user group, and a nifty deal on some Amiga external 3.5" drives (how does $159 grab you?). The Bandito saw more Amiga images on an Atari ST than on an Amiga (they've been busy converting Digi-View pictures over at Antic). The show has really slipped from the "good old days" when Jobs and Woz introduced their little Apple II, and similar technical innovations were common. This year, they even had a booth selling gold chains. What's next? People selling car stereos out of the back of their pickup truck?

Well, there was one bright spot for Amiga fans. Jan Lewis (computer industry pundit) conducted a well-attended seminar on Desktop Video. Over 500 video nerds watched some tapes presented by Dave Barrett of Aegis, Arthur Abrahams demonstrating Amiga Live!, and Tracy McSheery showing a tape of some painstakingly constructed VideoScape animation.

Broderbund showed a brief demo of Fantavision for the Amiga, a totally redone version of their Apple II animation software. The Bandito thinks that Fantavision (which should be out by the time you read this) will drive a nail into DeluxeVideo's coffin.

How about full 32-color animation with sound? The interface looks complicated, but then so is DeluxeVideo. (A DeluxeVideo II is supposedly in the works, but don't look for it this decade.) The highlight of the seminar was the appearance of the Video Toaster, presented by Tim Jenison and Paul Montgomery. The crowd oohed and aahed at the sight of live video manipulated in real time. When is it coming out? Look for it this summer, and they're still saying $799 (though the Bandito thinks $999 is more likely).

More information has reached the Bandito about Digi-Word, the HAM word processor coming from NewTek. It will use multi-color fonts like you've never seen before, and will allow you to map a digitized picture onto text fonts for the ultimate in personalized letterhead. Of course, HAM pictures can be integrated into a document, but something even better is possible—you can attach little animated sequences to a document (imagine Maxine saying hello to you from your letter)! How would you print this out? Possibly by using a series of flip animations on successive pieces of paper. This will certainly be a *unique* word processor.

Epyx is working on some supersecret hardware projects using old Amiga alumni, like Dave Needle and R.J. Mical. They've been remarkably tight-lipped about it, but the Bandito hears from his faithful spies that they're creating their own interactive VCR system. I-VCR is a hardware add-on to regular VCRs that gives you random access control over a videotape while it's playing. You can choose alternatives on the fly with no discernable time lag. This magic is accomplished by slowing down the frame rate somewhat (from 30 frames per second to about 22, not enough to really be noticeable) and putting additional info on the tape in the right way. The potential market is huge, with VCRs in at least 60 million homes. This technology would allow for some nifty games, especially role-playing and arcade games. Look for Epyx's unit to allow genlocked graphics over the video image. Imagine being able to play Dragon's Lair or FireFox on your VCR. There's no word yet on release, though there may be a showing at the June CES show.

The Bandito's friends in the Mac universe report that the next generation of Macs will have a two-button mouse. What's next—DMA or a blitter chip? Could be they'll think of that in a few years. By the way, some of the Bandito's predictions are coming true sooner than he expected. IBM will be introducing some new PS/2 models soon, and they are rumored to include a 12 MHz blitter chip to help move those windows faster. Of course, enterprising programmers can find a few other uses for a blitter chip, as we've seen so ably demonstrated on the Amiga. Someday, IBM might even add a sound chip. Wake up, Commodore! Apple and IBM are breathing down your neck, and they don't want to kiss you, either. It's not enough just to drop a 68020 in an Amiga 2000. We need more colors and higher resolution, at least as options. Time is running out....

•AC•

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C Notes from the C Group

by Stephen Kemp, PLINK ID: SKEMP

An Introduction to C Programming on the Amiga.

The C language was designed to be a universal language that would make programs portable from machine to machine. Originally designed for the UNIX operating system, it is perhaps as close as we will ever get to a universal computer language. Although a number of other languages like BASIC and Pascal are available on many different computers, none enjoy the degree of portability that C does.

C is best classified as a "low level" programming language, because the instructions manipulate only the smallest units that a machine understands, i.e. bytes, numbers, and addresses. However, when used in association with function libraries, it can become as "high" or as "low" as required. Almost anything, from operating systems to arcade games, can be written in C.

Is C hard to learn? Well, that depends on you. If you understand the basic programming concepts of variables, statements, and functions, then you certainly have a head start. Ignorance of the basics won't keep you from learning C if you have the desire—it just might take a little longer. Regardless of your background, you won't learn C overnight, but if you put in the effort you will be well rewarded.

When learning C, it is helpful to have good reference materials. The Bible of C is *The C Programming Language* by Kernighan and Ritchie; however, other excellent tutoring materials have been written that you may find easier to read and understand. Kernighan and Ritchie's book is great when you want to know specific syntax, but it is not very good for explaining the concepts of writing a program.

No matter which book you buy, don't expect to sit down and read from cover to cover like a novel. The better ones will have lots of examples and lessons, and the best will also have a well organized index for looking things up on the spur of the moment.

Of course you will need a C compiler. There are two very good choices available for the Amiga: Lattice C Compiler from Lattice, Inc. and Aztec C from Manx Software Systems, Inc. Often, you will hear these referred to as Lattice and Manx. The Manx compiler is used for most of the programming examples that you will see in this column, but this does not necessarily mean that Manx is the best choice. A number of enhancements have been made to both of these products since I made my initial purchase. The best way to decide which to buy is to read reviews and talk to users of both products.

If you are not ready to invest in a C compiler, either because you are not sure whether you will like the language, or because you don't know which compiler is better, visit your local Bulletin Board System. On a BBS you can meet people with varying opinions about the C language and C products. Granted, bulletin boards may not provide all the information you want, but they will let you find out what other programmers think.

Visiting the BBS may cause some doubts too. Almost every programmer has some knowledge of the C language, and most programmers have strong opinions about the capabilities of C even if they have never programmed in the language. The old adage "a little knowledge can be a dangerous thing" is often true because some of these opinions, unfortunately, are negative. This negative attitude is due largely to something called the Baby Duck Syndrome.

We have all heard the story that when a baby duck emerges from its egg, it thinks the first thing it sees is its mother. This is true for many programmers, in relation to programming languages. Although it may not be the first language they learn, many programmers become comfortable with a language and then have no desire to look for anything new. Being comfortable with a language is fine, but some of these people put on their crusading outfits and endlessly accost others about how "their" language is the best and all other languages have terrible faults that can't be overcome.

One thing I have discovered is that there is no absolute best language. The best programmers are those who constantly seek new knowledge and will give everything (and everyone) the benefit of a doubt. If you meet one of those crusaders, just remember that computers and programming are continuously generating. Programmers who can't or won't evolve with the industry will one day be extinct.

With reference material and compiler in hand, it is time to write our first program (see Listing 1). As with most tutorials, I have started with a "hello world" example because it is quick and easy. Figure 1 is a diagram of the parts of our program discussed in the next few paragraphs.

Listing 1

```
/* C program example 1*/
/* This program will print a message*/
/* and then return to dos */
main()
{
    printf("Hello World\n");
}
```

Figure 1

1. Comment	/* C program example 1*/
2. Comment	/* This program will print a message*/
3. Comment	/* and then return to dos */
4. Function declaration	main()
5. Beginning of function	{
6. Library function call	printf("Hello World\n");
7. End of function	}

C programs are made up of functions. All C programs require a function named "main" to designate the entry point where execution of your program begins. Any program could be written entirely in the main function, but you will find this is unwise after your programs grow large and complex. Remember, fewer functions don't necessarily make smaller or better programs, and can hinder future program maintenance.

The first three lines are comments and have no effect on our program. Comments are text occuring between the start "/*" and the end "*/" comment markers. Commenting is a good habit to form. Many programmers, including myself, fail to comment programs enough. Often a function is written that either makes certain assumptions or is extremely complex. In the future, if changes or bug fixes are required and we can't remember those assumptions, we will have to figure them out all over again. A well-documented program can help prevent this problem. It is not necessary to comment on every line (some may argue), but you should at least document what each function assumes and what it will do. Although we haven't named any other functions or variables, by using meaningful names you can reduce the number of comments you have to write in future programs.

Our main function is declared on line 4. As stated before, this is where our program begins. If our function was expecting parameters, they would be listed between the parenthesis following the name. Since we expect no parameters, the name is followed by an empty set of parenthesis.

The open brace on line 5 indicates the beginning of our function. The open brace is needed to distinguish the definition of passed parameters from our function's code. Line 7 is a closing brace and indicates where our function ends. When the end of a function is reached, program control is returned to where this function was called. All C programs are finished when the end of the function main is reached. (There are ways to end a program before the end of main is reached, but let's save that for future discussion.)

Line 6 is a call to a function that is defined in our C library named "printf". Unlike many languages, C doesn't have built-in functions that handle input, output or object manipulation. (Objects are things like character strings, arrays and structures.) This enhances the portability of the language but means that functions have to be written to do these things. Fortunately, C compilers come with a "standard" library of functions that handle input, output, and object manipulation. The standard library that comes with one compiler, however, may not be exactly the same as one accompanying another compiler. You can expect many of the functions to be similar. "Printf" is one of these standard functions. It will output the

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string contained in quotes to the screen. Over time, you will see that "printf" is probably one of the most powerful functions in your C library. Perhaps a future article will cover the usefulness of the "printf" function and all its derivatives.

Notice that line 6 is terminated with a semicolon. The semicolon is used to separate individual statements and declarations. If you fail to include a semicolon after each statement or declaration (a very common mistake), an error message will be printed when you compile your program.

The \n contained in our message is the representation for the newline character. After our line is printed, the screen pointer (where subsequent lines would be printed) is set to the next line. Compilers understand the \ character indicates the beginning of an escape sequence. The character following the \ tells the compiler which character to substitute into the string. Most compilers support a number of escape sequences because it is a convenient way of indicating characters that usually don't have text characters to represent them. For more on escape sequences, see Figure 2.

Figure 2
Normally, compilers will support all of the following escape sequences:

\n — Newline (Linefeed)
\r — Carriage Return
\t — Tab
\b — Backspace
\f — Formfeed
\0 — Null

Usually, any character can be represented by a 3-digit octal number following the \ character. Additionally, most compilers will assume that the character following the \ character is to be left alone if it is not one of the compiler's defined sequences and not an octal number. Look at these examples:

Source	Output
"This string has a \\ in it"	This string has a \ in it
"This string has a \" in it"	This string has a " in it
"This string has a \132 in it"	This string has a Z in it
"This string has a \bn in it"	This string has an in it

Save your program with the name HELLO.C. Usually the ".C" extension is assumed on C source files.

Now that our program is ready, it is time to compile it. (As mentioned at the start, I am using the Manx C compiler and linker. If you are using something else you may have to refer to your documentation for the proper syntax to compile and link your program.) At the CLI prompt type:

```
CC hello.c
```

This invokes the program that compiles your C source code into an object format. Object files are not executable. The linker is the program that actually makes the executable file. I won't try to explain exactly how a linker works because it is not important here. The brief explanation is that a linker is required to resolve external references, define addresses and search the C library. To link our program type:

```
LN hello.o -Lc.lib
```

"LN" is the name of our linker; "hello.o" is the name of the object file (usually an extension of ".o" is assumed); "-L" is a linker directive that names the library we want to use. In this case, the library is named "c.lib" (the ".lib" is usually assumed by the linker). The linker also assumes you want the program named according to the first object file. Since we have only one module, the executable program will be named HELLO. Assuming that all has gone well, you can now run your program that was written in C. At the CLI type:

```
hello
```

You should be rewarded with a "hello world." Congratulations on your first successful C adventure.

Now that you have made your first program, go back and modify it to print something different. Don't be afraid to venture out on your own; after all, you can learn a lot by experimenting. •AC•

An AmigaForum Conference with Jim Mackraz, the *"Stepfather of Intuition"*

Edited by Rick Rae

A conference with Jim Mackraz and Dale Luck was held on AmigaForum CO channel 2 on March 16, 1988. The following is a heavily edited transcript of that conference.

RR: Welcome to a very special formal conference, featuring Jim Mackraz, who needs no further introduction (and I know you'd rather read his words anyway). And lurking in the background but hampered by a scheduling conflict is Dale Luck. Jim, would you like to make an opening comment?

JM: This is Jim Mackraz, "stepfather of Intuition," and currently under contract to produce V1.4 with some other Los Gatos survivors. And with some West Chester REAL survivors.

RR: Let's open the floor for questions. Paul B, go ahead please.

Paul B: Jim, can you tell us what extra features we will see in V1.4. Will it also be a Kickstart upgrade?

JM: V1.4 will be a Kickstart upgrade, plus a Workbench disk. We plan several significant evolutionary changes. One of my favorites is support for hardware scrolling of screens. The FFS will also be in ROM, for use on floppies. It's basically a standard fix/enhance release, plus support for some unannounced hardware changes (hehehe).

RR: Keith, you were next, go ahead.

Keith: Thanks. First Jim, thanks for stopping by. You just mentioned "hardware scrolling of the screens"; would that be some kind of replacement for "ScrollRaster()" ?

JM: Not really. ScrollRaster is a blitter operation; it moves bits. This would be system support for the hardware capability to scroll the displayed portion of a large bitmap by changing a couple of pointers. There are some low-level hard parts, and some user-interface questions, like menus.

Keith: OK, then I guess I have another question: using "ScrollRaster()" on a multi-bitplaned screen without double-buffering, the display causes a certain bit of "jumping." Do you know if there will be an improvement on it?

JM: Dale says, "Probably not."

RR: Dale, is this related to software or hardware? i.e., will running a 68020 improve the "shearing" which occurs when scrolling, or is it tied to the blitter?

JM: Dale says, "It is the blitter doing it, a 68020 won't help."

RR: OK. Dave Weinbach, you're next.

(Dave Weinbach) I have run into a problem about which I have heard nothing. That is that extreme overscan and the 2090 don't get along at all (R/W errors). Any plans to address this with software? Like reducing bitplanes on the fly? (Problem seen with Videotitler and PPage w/more rows.)

RR: This problem was discussed in an earlier conference here with Dave Haynie.

JM: This has been addressed. It will see the light of day with the A2090A controller's driver in ROM. A fix in the disk-based driver is also done, but I don't know how/when it will be available.

Dave Weinbach: The fix in software is for the 2090A? And what of those of us with plain old 2090s?

JM: As I said, there is a fix in the disk-based driver, too. I just don't know when/how it will become available.

RR: Jay Craswell, go ahead please.

Jay Craswell: Will you support more than one monitor?

JM: Probably not more than one monitor at a time, with current hardware.

RR: Don Lawrence, go ahead please.

Don Lawrence: OK, thanks. Two questions: 1: I've heard rumors of a 512K Kickstart. I love the idea, but being a 1000 owner, I'm just wondering if this is possible on my machine. 2: I've noticed that recently Commodore has been seeming to "de-emphasize" the Amiga in Amiga(?); i.e. taking the left Amiga key and making it a Commodore key, eliminating the Checkmark ... any comments on that?

JM: The 512K rumor is one of my favorites, as a systems programmer. I don't have any comment on that, apart from mentioning that the A1000 user base is the subject of some VERY protective instincts by the software

(continued)

team, on both coasts. As for deemphasis, I don't see it. They put the A key back, and Los Gatos never liked the checkmark. They're just trying to do some marketing kinds of stuff. Nothing malicious, I'm sure. They know where their future lies, I believe.

RR: Thomas Holaday, go ahead please.

Tom Holaday: Amiga stereo makes it possible to think about sound "position." If I want to have instruments spread across the listening area, however, I must do complex mathematical wave manipulations. Any hope of an audio blitter to let me have a marching band move about the room, in real time, via mouse control?

RR: Wow!

JM: Uh, I don't know exactly what that would take. Good luck!

RR: Mike DeVonish, go ahead please.

Mike DeVonish: We have all "heard" of new or upgraded chips for AMY coming soon; my question is, are things like more bitplanes and color registers in the upgrade path? Or is this too difficult and more like "32-bit" versions of the chip set?

JM: OH BOY! I've been waiting to use this disclaimer file ...

We are not at liberty to discuss any unannounced engineering projects which may or may not be underway at Commodore Business Machines, Inc., or any other client. We hope you understand our position in this regard.

Let me say that the problem with DMA bandwidth is well-appreciated in engineering. That is to say, they're all working on it, but I have nothing to report.

Mike DeVonish: Thanks anyway, by the way I LOVE the checkmark!

RR: Vic Wagner, go ahead.

Vic Wagner/Metadigm: There has been a bit of discussion here on CIS about needing more standards. Are there areas in which you perceive a need for standards?

JM: Indeed. Commodore has signed a license for Commodities Exchange, my input handler standard. It needs some more work of course, and I don't have any insight into the distribution plans. But it is pretty important. I also think that the IPC business is very important. There is lots of activity on USENET these days (LOTS and LOTS). Oh yes, IPC stands for InterProcess-Communication. I personally feel that anything that comes out should not be ignorant of the AREXX work Bill Hawes has done (although I think a non-REXX server should be possible).

RR: Ariel, go ahead please.

Ariel: Jim, I'd like to ask a bit about Intuition. What shape did you think it was in when you took it over? How do you feel you've improved it since then? And where do you see it changing in the future?

JM: Is this a trick question? Well, Intuition V1.1 (I came in on the middle of V1.1: before the bug fixes) was sort of rushed, in fact it was a BIG miracle that it was as far along [as it was]. My key contribution was to make it re-entrant, and working out the bugs that you don't find until you get a lot of fanatics banging away on something. My other main thrust has been to try to make it more possible to do things that weren't thought of when it was first designed, like render into your own requesters, use a different state model for your input, or not have a title bar drawn just to get screen dragging. I strongly hope to make much more progress on "extensibility" by the applications.

RR: Jim, do you see the intensity of software development increasing, decreasing, or staying the same as compared to, say, a year ago?

JM: Well, it is a LOT more active in Los Gatos this year. Where there were just two software engineers after the shut-down (Dale and Bart), there are four now, with a fifth coming on line. We are very active. I think it has something to do with Commodore not being broke at the moment, plus needed support for new devices, like the hi-res A2024 grayscale monitor.

RR: Glenn, go ahead.

Glenn: I know that Amiga sales have been very good and was wondering if you had any numbers for total 500 and 2000 sales to date?

JM: I have no great information, nor can I get anyone to discount the claim that they sold 500,000 world-wide by Jan. 1, 1988.

RR: Miles Kurland, go ahead.

Miles Kurland: Are there any things you would like to see Amiga developers doing that they aren't? Or any system features you feel are underexploited (like the clipboard)?

JM: Well, I can't believe there is not a structured drawing program a la MacDraw, although I'm glad since I want to write one. I think the clipboard has to come along, and we'll try to help it along at the DevCon with some examples, etc. I am working on ways that people can get at the display hardware more directly, to use the REAL magic in this machine, without screwing Intuition, and I think there is a lot of potential in that, such as moving overlays for the "tracing" operation of a draw program. Oops, there goes one of my ideas.

Miles Kurland: Thanks. I'm one of those who wants that graphics stuff!

RR: Don Lawrence, go ahead please.

Don Lawrence: Thanks. A couple of short ones (Which I'm sure you've heard ...): When will 1.4 be released? What would it take to make you call something "2.0"? And Dale: How about selling checkmark stickers to 500/2000 owners?)

JM: I have a nice answer all ready for part one. We also don't like the checkmark. Do you mean the bouncing ball?

Don Lawrence: No, the checkmark!

JM: It is my hope to get rich selling a little ball sticker for the side windows of cars, like that little apple job. If you want checkmarks, there is a whole catalogue of junk. I like the socks and the "members only" jacket. I just don't like the checkmark.

Don Lawrence: What about 1.4/2.0?

JM: Oops, here's the answer ...

We are not at liberty to discuss any unannounced engineering projects which may or may not be underway at Commodore Business Machines, Inc., or any other client. We hope you understand our position in this regard.

The V1.4 release will incorporate major evolutionary changes in both the Workbench and Kickstart system software. We cannot offer a schedule for this project, but we do not expect to release it before the latter portion of this calendar year.

Don Lawrence: Thanks.

RR: Jim, care to address the "2.0" question? What would it take to make the leap to "2.0" in your eyes?

JM: We're saving the designator 2.0 for a non-compatible release. Then, of course, all bets are off. Especially the bet on us getting our contracts renewed. (Grin) I don't think anyone in CBM management has a taste for an incompatible release. I DO hope we get a chance to make a "revolutionary" release, not just these "evolutionary" ones. I have a list of things I'd like to see, all big projects.

Don Lawrence: Great answer—Thanks!

RR: Go ahead, Keith.

Keith: Thanks. Dale, I guess this one's for you. It has been rumored that you have put together the only existing "portable" Amiga (!). Is this a reasonable thing (hardware-wise) to produce? (I _want_ one!)

JM: HA!!! DALE JUST LEFT FOR THE AIRPORT. HA HA!... Can I say a little more: the Amiga is video based, and not real conducive to LCD technology. It won't be a "natural" phenomenon to make a portable.

RR: Daryl Thachuk, go ahead.

Daryl Thachuk: OK, what are your opinions about the Amiga in the business world; is it worth my time to develop some business software?

JM: Well, I think CBM leaves a lot of bases open in the business market, so I don't BANK on a big win over Apple or the Clones. I DO think that suitably horizontal packages will get VERY GOOD penetration in the Amiga market still. So, if I was going to write a word processor, I think the Amiga is a good platform, compared to Mac/Clones (not that I recommend doing a WP), but if you are planning a job costing package for construction, do a PC version. I hope this illustrates my meaning of "horizontal."

RR: Jack, go ahead please.

Jack: I have two questions: Will 1.4 allow for setting the font used by string gadgets? And will there be some sort of locking added to screens so that other tasks (parasite/utilities) may open windows without worrying that the user may close the screen prior to closing the foreign task's window?

JM: Absolutely, you will have much greater control of string gadgets, both for display and input formatting. Proportional fonts will be supported. I'm not so excited about parasite windows, especially since I think they can be supported by code NOT in the ROMs. I may do some sanity checking on CloseScreen() if that helps people do magic outside of the ROMs.

RR: Mike DeVonish, go ahead.

Mike DeVonish: Thanks (this time I won't hit a nerve). Jim, you said something about some REAL Amiga stuff, what has not been done with the machine yet?

JM: Well, I think the copper is underused. I think the magic you can do with bitplanes is unused. I think there are applications for sprites in business applications, and audio, too. We don't have the resources that Apple does, and every time I hear about something like a "noisy desktop" I get jealous. I also think it could be the best computer for handicapped users, but we haven't got enough people inside to work on it.

RR: John, go ahead please.

John: This may be controversial but here goes. How have rumors about future developments affected current development? Do they help to stimulate new ideas, or do rumor columns in magazines hinder progress in general (and what can be done about the problem)?

RR: Please note I've NOTHING to do with AC's "ROOMERS" column, ok?

JM: I don't think it's a real problem. Sometimes it's hard to be working on the grunt stuff and hear someone report that we're working on a Display PostScript chip or something wild. Generally, there has been so much of this over the years, that it is only amusing to the principals. The new ideas come often from BIX, Usenet, or CIS. The rumor columns are rarely practical.

RR: Susan Molnar, go ahead.

(continued)

Susan Molnar: Hello! Who's idea was it to put the names on the inside of the AMY case? And will Amiga DOS take advantage of the new WORM drives?

JM: You'll note that my name is not inside the case (too late), but if I had to guess, I'd say it was [originally] Apple's idea. I understand that they [C/A] have WORMs in house, with plans to hook 'em up. CSA has one at the present time, so it's available.

RR: Daryl Thachuk, go ahead.

Daryl Thachuk: What's the future of the A1000 and is it true about an A3000?

JM: I can't comment on any A3000 type stuff. We intend to support the A1000 as long as we can, but you'll see that we can't let it hold back ALL progress. Irving Gould was misquoted as saying that the new chips would plug into an A1000. Just let me say that that got some of the WC engineers thinking.

RR: Jim, go ahead please.

Jim (Eet): Ok, first everyone I talk to says they love the checkmark. Will 1.4 support the proportional controllers?

JM: You can have the checkmark. Don't you like the bouncing ball? I don't know about prop joysticks. We do have the input expert (Kodiak) working with us now.

RR: Don Lawrence, go ahead.

Don Lawrence: Thanks. "We made Amiga, they fudged it up": Who did it? Is there a story here somewhere? (Checkmarks! Lets have checkmarks! How about a vote on it?)

JM: I know nothing, I see nothing, I hear nothing, and I want my contract renewed.

RR: Linda F., go ahead please

Linda F.: Daryl already asked the question about the A3000 so, before I start lusting after the A2000 (not that I love my A1000 any less), are there any plans to upgrade the Sidecar attachment, since I understand that Sidecar cannot access the A1000 serial port. And (not a question) whoever named this machine has my compliments ... it is the perfect companion and friend.

JM: As Marketing Heavy Rich McIntyre said at AmiExpo, "You turn on the Sidecar, you get a PC clone. Does it work? What more do you want?" I'm glad you like the name. I don't believe there are upgrades planned for the Sidecar.

Linda F.: Then how does one transfer IBM files downloaded from Compuserve on the Amiga side to the IBM Sidecar so that they are accessible to, say, the IBM at the office? Or am I asking too much?

JM: You're just asking the wrong puppy. I think PCCopy goes both ways, but I'm sure there is more to it than that. Sorry.

Linda F.: Okay, thanks anyway!

RR: Daryl Thachuk, go ahead.

Daryl Thachuk: Is there a possibility of a PS/2 card for the A2000?

JM: PS/2? Ick. I suppose the possibilities are endless, but the interface is based on an XT/AT bus, so it wouldn't be natural, since the PS/2 has the Micro-channel bus. Ick.

RR: Paul B, go ahead please.

Paul B: Can you give us ANY idea if we will see a hypertext-based system for Amy? Also, can you tell me if my current 2090 controller will autoboot with 1.3?

JM: Well, I feel comfortable saying that a "Hypercard" size project isn't the kind of thing going on within CBM these days. Anything in this area will come from a third party, perhaps with a little help from CBM. Your A2090 will not autoboot, since there is no driver in ROM, and you can't read one off the disk until you've got a driver for the disk from somewhere. Maybe someone will hack up a mod, but it probably won't be CBM.

RR: Doug Winger, go ahead.

Doug Winger: First, I vote for the checkmark. My question is simple: when will the Chip RAM be expanded past the 512K mark?

JM: My answer is even simpler: "We are not at liberty to discuss..." But I think the new chips are kind of announced. They are drop-ins (with jumper change) for A500's and A2000's, which must be installed by a dealer/service outlet. They should appear this calendar year, but I'm not authorized to commit to any dates.

Doug Winger: OK, as long as I know they're in the pipeline, I am happy.

RR: William Hawes, go ahead.

W Hawes: What areas of development are manifestly outside of the manifest destiny of CBM, for those of us planning our next development project?

JM: Manifestly speaking, I'm sure there is no policy, as such. I don't know how to answer your question, although I hope to get the opportunity to discuss it with you. I could only guess they won't do any applications, but they may well jump into bed with a vendor on some particular area, like they seemed to do with Desktop Publishing. I understand your concerns; in fact, I share them. I'm clearly not the individual to make a statement on this. I think that AREXX targeted a good area, and I don't know what happened business-wise with it. It seems that people make money competing directly with CBM in some areas, such as disk controller/drivers.

RR: And with that it's time to call this one a wrap. Thanks Jim and Dale for an excellent evening, and thank you all for attending.

•AC•

SON OF 7 ASSEMBLERS

for the Amiga

by Gerald Hull

About a year ago, *Amazing Computing* published my comparison of seven different native-code assemblers for the Amiga. Almost immediately after that article appeared, new versions of those assemblers were released, and entirely new packages appeared on the horizon. The present article represents another survey of the current state of Amiga assembling.

The Contestants

Many of the packages bear familiar names. Metacomco and Lattice have released significantly upgraded versions. The Manx assembler has not changed much, but this time I had access to its linker, and can give a more rounded evaluation as a result. HiSoft now offers a CLI-based version to complement its editor-integrated assembler.

The greatest turnover has been in the realm of public domain assemblers. Douglas Leavitt, to my knowledge, has not upgraded the program I examined in the first go-round. Wesley Howe brought out a number of revisions to his public domain assembler; however, he has since ceased to support it. He has now released a commercial assembler through Inovatronics that we'll be looking at.

An assembler described as "NOT Public Domain" but "freely distributable" has been converted for the Amiga by Charles Gibbs. The complete source code is provided, so if you have any complaints you can simply rewrite it. A new commercial assembler comes from Abacus, famous for their products for the Commodore 64. In effect, it takes the place of Quelo, which no longer offers a native code Amiga version.

AMA Compatibility

As in the first comparison, a major consideration in evaluating these assemblers is their compatibility with the original product for the Amiga. Produced by Metacomco, it is still sold as the "Amiga Macro Assembler." However, it is no longer accurate to discuss this in terms of "Metacomco compatibility," as I did in my original article. The new Metacomco assembler is not 100% compatible with the old, though the differences are very minor.

The phrase "Amiga compatibility" would be misleading as well, since all the assemblers we shall look at run perfectly well on the Amiga, despite any idiosyncrasies. I therefore shall use the expression "Amiga Macro Assembler compatibility" for that purpose, abbreviated to "AMA compatibility."

The importance of AMA compatibility is threefold. First, the majority of existing examples of Amiga assembler code reflect the features of that program. Second, the official assembly language include files released by Commodore reflect those same features. Those "includes" provide the definitive expression of the macros, symbols, and structures of the Amiga operating system.

Third, most of the features of the Amiga Macro Assembler were ported directly from the Motorola "Family Resident Structured Assembler," as described in document "M68KMASM/D10." Consequently, AMA compatibility also means you should be able to use much of the code written for non-Amiga 68000 machines more or less directly, assuming their assemblers also reflect the Motorola influence.

As we shall see, particularly with regard to the Abacus assembler, this compatibility is not absolutely crucial. Programs can be amended and includes can be rewritten. Nonetheless, the degree of AMA compatibility provides a good measure of how much "massaging" you will have to do to existing 68000 assembly code, and how able you will be to assimilate new releases of AmigaDOS.

The Evaluation

As in my original comparison, a primary means of evaluating the relative capabilities of the different assemblers is the public domain program STARS10, written by Andrew Tuline of Vancouver, Canada, and released on Amicus disk #12. It consists of some 600 lines of AMA code, and makes extensive use of the Commodore includes. As such, it provides an excellent gauge of AMA compatibility.

The includes represent one aspect of compatibility, but there are a number of AMA features they don't make use

(continued)

of. Consequently, I charted some of those features to show how the various packages measure up. I also tried to compare the usefulness of the user feedback the assemblers provide, especially in the case of errors, and the degree of control they provide over the object code produced.

In addition, I use STAR10 to compare the speed of the various assemblers. The mere fact that I am able to do this is a measure of how far compatibility has advanced in Amiga assemblers. When I did the first comparison, only two of the packages (other than Metacomco, of course) assembled STAR10 without error, and only one produced a runnable program.

This time, with a great deal of diligence and persistence, I have been able to produce an executable result with every one of the assemblers. This enabled me to use the STAR10 program to generate timings that reflect their speed either with or without listings, and with include files either on disk or in RAM.

Finally, many of the packages come with additional features and complementary programs that facilitate or augment assembly language programming. You can find integrated editors, debuggers, high-level interfaces, and assorted programming aids, not to mention linkers and C compilers. It's up to you to decide which features count the most.

Abacus

The most idiosyncratic assembler is ASSEMPRO from Abacus, Inc., 5370 52nd Street SE, Grand Rapids, Michigan 49508, (616) 698-0330. The package consists of a disk and 105-page manual, and lists at $99.95. It provides the most or the least, depending on how you measure things.

On one hand, it's the most complete package of assembler utilities. The program not only comes up with an assembler and integrated editor, but also a debugger window and a table that provides information on the 68000 command set. It can generate and debug 68010 code. Furthermore, you can call up both a disassembler and a "reassembler," that is, a disassembler that produces code ready for reassembly (without line numbers, etc.).

On the other hand, ASSEMPRO does not produce linkable code—an XREF or XDEF gets you a "command not implemented" error, for instance. Despite the claim that "differences from other assemblers are relatively small," it is by far the least AMA compatible of any of the seven assemblers. As a result, it cannot use the Commodore includes. In compensation, Abacus provides its own includes as well as "Offset files" to take the place of AMIGA.LIB.

You can save a particular configuration of ASSEMPRO—memory allocation, window placements, control settings, and so forth. It is one of only two packages with this useful capability. However, in other respects the user interface seems awkward. For example, the "Open" file requester doesn't remember the file it last loaded.

ASSEMPRO is the only assembler reviewed that provides no version that runs directly from the CLI, if that's important to you. It's also the slowest of the six commercial assemblers tested. And its memory requirements are enormous. The configuration for the STAR10 program, not particularly large by Amiga standards, gobbled up more than 330K. It cannot be recommended for a system with only 512K.

Inovatronics

This assembler marks Wesley Howe's graduation from the public domain to the commercial realm of assemblers. CAPE (Complete Assembler Programming Environment) comes with a disk and a 46-page manual from Inovatronics, Inc., 11311 Stemmons Freeway, Suite 8, Dallas, Texas 75229, (214) 241-9515. The retail price is $89.95. CAPE is another editor-integrated assembler, giving you the choice between WordStar and EMACS command sets, and providing user-definable function-key macros. It can generate 68010 code as well, and comes with ARexx interfacing built-in. Like Abacus, the user can save a particular system configuration for later use. The package also comes with an assembler called CASM that can be invoked directly from the CLI.

The CAPE "Read" file-into-memory requester doesn't show what's in directories, unless you also happen to have Inovatools 1. This kind of product tie-in I can do without. Also, it automatically names your object code "AsmObjTemp," instead of using the name of the file you loaded, and unlike Abacus or HiSoft it does not let you step through the syntax errors it finds.

Nonetheless, Howe's apprenticeship in the public domain has clearly borne commercial fruit. CAPE and CASM provide many user-selectable optimizations, including the ability to specify PC-relative and base-register assembly code. They are also among the fastest and most AMA compatible, with a rich set of additional directives and pseudo-ops that can be very useful. And they excel at object code control.

The early version of the CAPE package I received did not provide any version of the Commodore includes, and had at least one glaring bug: CASM would GURU if you didn't provide a source file name. However, I have been assured that these problems are being fixed. Inovatronics has a generous update policy. Just send in the disk (no cash), and they'll mail you back the latest version.

Gibbs

The freely distributable assembler A68K has been released by Charles Gibbs, #21-21555 Dewdney Trunk

Road, Maple Ridge, British Columbia, Canada V2X 3G6. He provides five pages of documentation along with complete source code in the distribution package. You can find it, along with a public domain C compiler, on Fred Fish disk #110.

A68K is based on Modula-2 code published in Dr. Dobb's Journal by Brian Anderson in April, May, and June, 1986. Gibbs translated the code for the Amiga Manx C compiler. Were this a sub-standard assembler, the mere fact that the source is available would silence most complaints, especially if you're a hacker like me. Just rewrite the parts you don't like!

But the program has nothing to be ashamed of, even when compared with commercial products. It is the slowest of the seven, to be sure, but not intolerably so. It is among the more AMA compatible, and automatically performs a number of useful optimizations. A68K provides considerable control over listing, symbol table, and object file output. In short, the Gibbs assembler shows few of the deficiencies that marked the non-commercial programs in my first comparison.

Indeed, A68K is the only one of the current batch of seven to generate Motorola S-records. They are of little use on the Amiga, but handy if you want to download to target 68000's. I did find one bug in the parsing of the option that controls the allocation of RAM for the primary and secondary heaps used by the assembler. If I get the chance, I'm going to fix it.

HiSoft

The Devpac Amiga package comes from HiSoft, The Old School, Greenfield, Bedford, United Kingdom, MK45 5DE, (0525) 718-181. The 1.2 release contains two disks, a 112-page ring-binder manual, and a Motorola 68000/68010 Pocket Reference Guide for good measure. It seems generally unavailable in the United States, which is unfortunate. It retails for approximately $100. If you already have version 1.0, you can upgrade to 1.2 for about $35.

You get GENAM, an integrated editor assembler; MONAM, a debugger monitor; and new with the 1.2 release, a CLI version of the assembler called GENIM. The latter is for people who want to set up a batch file for a whole sequence of assemblies, which can execute automatically while they're raking their lawn. But with HiSoft, you won't get much raking done. Without listings, the assembler fairly screams along; it is by far the fastest in this mode.

I took my timings from GENIM. Although GENAM is very user friendly when it comes to reporting errors—it will step you through them one by one—GENIM is somewhat the opposite. You cannot stop it with control-C once it's started. Depending on what kind of errors you've made, you can have a frustrating wait before it's through.

GENAM, like CAPE, does not show directory contents when you "Open" a source file for input. And though generally compatible with the Commodore includes, it does generate a "label defined twice" error in some cases. Finally, it falls short on some other items of AMA compatibility; local labels (1$) and octal constants (@7654) are not allowed.

Minor complaints aside, Devpac Amiga is a full-featured and highly professional assembly language package. It gives you a great deal of control over listings and object code, and—when not producing listings—assembles code at a speed you will find hard to believe.

Lattice

The ASM assembler comes with the 4.0 C package released by Lattice, Inc., 2500 S. Highland Avenue, Lombard, Illinois 60148, (800) 533-3577. For $200, you get four disks containing it, the C compiler, an enhanced version of Blink, sundry utilities and examples, plus a 476-page manual.

Alas, inside the otherwise impressive manual there is virtually no documentation on ASM. It says "It supports . . . an extensive set of assembler directives," but aside from brief references to CSECT and XDEF, it says nothing about them. As a result, you have to experiment to find out what the assembler can and cannot do. The only way it generates a listing is via redirection of screen output, which seems a bit of a kludge. It does not seem to provide for symbol table listings.

With respect to AMA compatibility, the 4.0 version of ASM is a great improvement over 3.1. It no longer disallows labels on the same line as MACRO directives, and swallows the Commodore includes with nary a hiccup. It is not AMA compatible in some other respects, however; no local labels (1$) or binary constants (%10110) are allowed, for example.

I found a major bug in ASM's object file generation. Anything that causes it to output a number of bytes that isn't a multiple of four—for instance, a DC.B character string—precipitates an "object file seek error" that terminates assembly. I have been unable to find out if this is a known or remedied problem. You can get around it, however, by appropriately inserting pad bytes.

Manx

The Manx C Professional System consists of three disks and some 600 pages of documentation in a standard three-ring binder, at a list price of $199 from Manx Software Systems, Inc., P.O. Box 55, Shrewsbury, N.J. 07701, (800) 221-0440. Along with the C compiler, linker, and symbolic debugger (DB) you get an optimizing 68000/

(continued)

68010/ 68020/68881 AS assembler. Some 20 pages of the manual concern the assembler.

The 3.6 release of AS does not appear to contain many changes from 3.4. According to the documentation, the only addition is an option to enforce alignment on 4-byte boundaries. In fact, the assembler refuses to accept this option. Also, the new, highly touted Manx SDB source level debugger appears to work only with assembler code generated from C source.

Despite these gripes, the AS assembler is awesome. Overall, it is the fastest of the seven tested, and most versatile as far as the 68xxx chip set is concerned. And it is very AMA compatible. There are, however, some differences in the handling of CODE, DATA, and BSS directives, as well as peculiarities relating to the ability to optimize to PC-relative and base-register code. There are other optimizations as well.

Of assemblers producing linkable code, Manx is the only one that doesn't generate output for the Alink and Blink utilities associated with Lattice and Metacomco. It uses the Manx LN linker instead, which determines whether the code goes to CHIP or FAST memory. It is also the utility that generates the symbol table listing.

Without access to the Manx linker for my first comparison, I shamelessly assumed AS lacked those capabilities. I'm glad I've had a better opportunity to evaluate it. If one were to judge Amiga C compilers only by the assemblers they provide, Manx would win hands down.

Metacomco

We come finally to the latest offspring of the granddaddy of all Amiga assemblers. Version 11.00 of ASSEM comes from Metacomco Plc., 26 Portland Square, Bristol, England, BS2 8RZ, (44-272) 428-781. It consists of a disk and a 67-page manual, and retails for $99.95.

As remarked before, this new version is slightly incompatible with the original. It no longer accepts single quotes on files specified in INCLUDE directives. Aside from that, however, it seems completely compatible with the 10.178 version that set the default standard for assembly language programming on the Amiga.

Despite its royal lineage (or perhaps because of it), ASSEM remains the only assembler of the seven that cannot specify code placement in CHIP or FAST RAM. You'll need Commodore's ATOM or D. J. James' FIXHUNK to remedy this. Also, it does not generate 68010 code, nor does it perform any optimizations.

However, Metacomco has remedied the one major complaint against its earlier version: slowness. As the timings show, 11.00 is nearly twice as fast as its pokey predecessor, placing it near the middle of the pack in terms of speed. Professional and proficient in most every respect, ASSEM continues to set a high standard for Amiga assemblers.

About the Author

Gerald Hull is president of Creative Focus, a software consulting business located in Binghamton, New York. He shares his home with one dog, three cats, and a bunch of neat electronic toys.

TABLE ONE: USER FEEDBACK

Table One compares the seven assemblers according to various features relating to user feedback. It evaluates the ability to control the format and information content of listings, and other aspects of user friendliness. For instance, it shows whether or not a fatal error in assembling returns a non-zero value to the operating system. This is useful in terminating batch files, which might otherwise inappropriately continue on.

	Abacus ASSEMPRO —	*Inova.* CAPE/CASM 1.00	*Gibbs* A68K 1.02	*HiSoft* GENAM/IM 1.21	*Lattice* ASM 4.00	*Manx* AS 3.6a	*Metacomco* ASSEM 11.00
Listng ctrl	good	good	fair	good	fair	good	excl
Symbol tabl	yes	yes	yes	yes	no	yes	yes
Save Config	yes	yes	no	no	no	no	no
Error msgs	excl	good	good	excl	fair	good	fair
Return code	n/a	yes	yes	no	no	no	yes

TABLE TWO: OBJECT CODE CONTROL

Different capabilities with regard to the kinds of object code that can be produced are evaluated in Table Two. For instance, whether an assembler can generate stand alone code that doesn't require linking, or absolute code for non-AmigaDOS applications.

	Abacus ASSEMPRO —	*Inova.* CAPE/CASM 1.00	*Gibbs* A68K 1.02	*HiSoft* GENAM/IM 1.21	*Lattice* ASM 4.00	*Manx* AS 3.6a	*Metacomco* ASSEM 11.00
68010	yes	yes	no	no	no	yes	no
68020/68881	no	no	no	no	no	yes	no
Fast/chip	yes	yes	yes	yes	yes	yes	no
Optimizing	fair	excl	good	no	no	excl	no
Standalone	yes	yes	no	yes	no	no	no
Linkable	no	yes	yes	yes	yes	yes	yes
Absolute	yes	yes	yes	yes	no	no	no

(Table Three is located on page 110)

TABLE FOUR: ASSEMBLY SPEED

Table Four shows how long it takes the different products to assemble the STAR10 program. They were tested both with and without listing generation, and with the include files both on floppy disk and in RAM.

You should not put too much weight on these results. For instance, the Abacus assembler has different options that can speed it up. On the other hand, the timings don't reflect the 19 seconds it takes to load ASSEMPRO and the source program into memory.

The timings of the other assemblers were taken using the stripped down version of the Commocore includes, since Manx and HiSoft come with them already.

To provide some overall indication of the speed of the assemblers, I have concocted a statistic called the "Tenchstar Rating." It is the average of the four timings for each program, divided by the average produced by the original Amiga Macro Assembler.

	Abacus ASSEMPRO —	*Inova.* CAPE/CASM 1.00	*Gibbs* A68K 1.02	*HiSoft* GENAM/IM 1.21	*Lattice* ASM 4.00	*Manx* AS 3.6a	*Metacomco* ASSEM 11.00
FLOPPY							
List	3'12"	1'29"	3'59"	2'22"	1'54"	1'32"	2'10"
Nolist	3'08"	1'26"	3'50"	48"	1'47"	1'26"	1'56"
RAM							
List	1'00"	52"	2'52"	1'45"	1'15"	50"	1'14"
Nolist	56"	50"	2'43"	19"	1'09"	43"	59"
Tenchstar #	1.5	2.6	0.9	2.3	2.0	2.7	1.9

(continued)

TABLE THREE: AMA COMPATIBILITY

Table Three measures different aspects of Amiga Macro Assembler compatibility. Of major importance is the ability to accept the Commodore assembler include files. In addition, a number of other AMA characteristics are tested. For instance, the following mathematical expressions should evaluate as shown:

```
-1<<2!@23*3     =  $fd  =  253
128>>1&$ff/2-1  =  $1f  =   31
```

In much the same way, the treatment of character expressions was tested with these examples:

```
dc.l   'abcd'   =  $61626364
dc.l   '''79'   =  $00273739
dc.w   '*'      =  $002a
dc.l   'i''m'   =  $0069276d
```

Another AMA trait is the use of the zero macro parameter '\0' for size specifications. That is,

```
MOOV      macro
          move.\0  d0,d1
          end
```

and `MOOV.w`

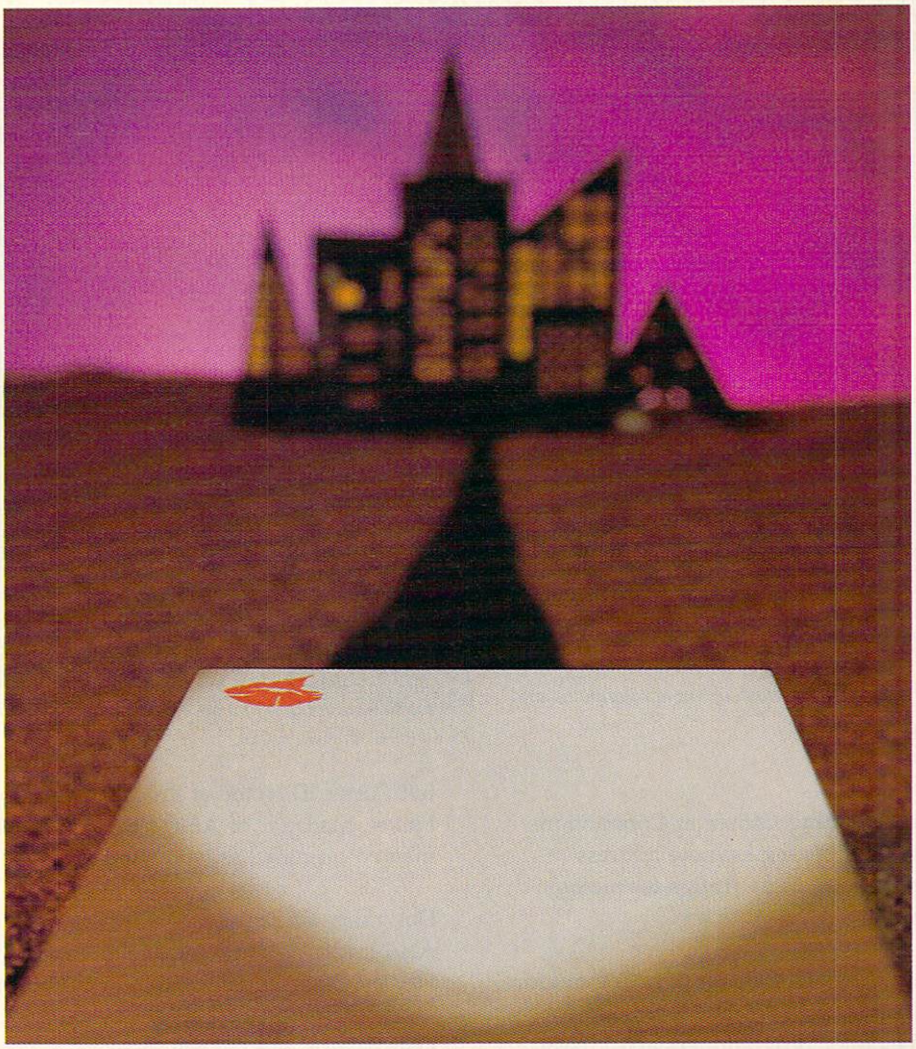
should generate `move.w   d0,d1`

In addition, Table Three tests the use of '@' and '%' to indicate octal and binary constants, respectively; '*' to mean the value of the program counter; the dollar sign form of local labels (1$); and '!' to represent inclusive or.

	Abacus ASSEMPRO —	*Inova.* CAPE/CASM 1.00	*Gibbs* A68K 1.02	*HiSoft* GENAM/IM 1.21	*Lattice* ASM 4.00	*Manx* AS 3.6a	*Metacomco* ASSEM 11.00
Includes	no	excl	excl	good	excl	excl	good
Numer exp	no a	yes	yes	yes	yes	yes	yes
Char exp	no	yes	no b	yes	no c	yes	yes
Param \0	no	no d	no	yes	no	yes	yes
Octal @	no	yes	yes	no	yes	yes	yes
Binary %	yes	yes	yes	yes	no	yes	yes
PC *	no	yes	yes	yes	yes	yes	yes
Local labs	no e	yes	yes	no	yes g	yes	yes
Inc or !	no f	yes	yes	yes	yes	yes	yes

Notes:

(a) Abacus evaluates #128>>1&$ff/2-1 as $40.
(b) Gibbs treats character strings according to the Motorola standard, that is, left justifies them. In this case, AMA does not follow Motorola.
(c) Lattice cannot handle the expression '''79'.
(d) Wesley Howe informs me that this has been corrected in a newer version of the assembler.
(e) ASSEMPRO has its own version of local labels.
(f) The Abacus assembler uses '|' to indicate inclusive or.
(g) However, Lattice unlike AMA requires a colon on local labels (1$:)



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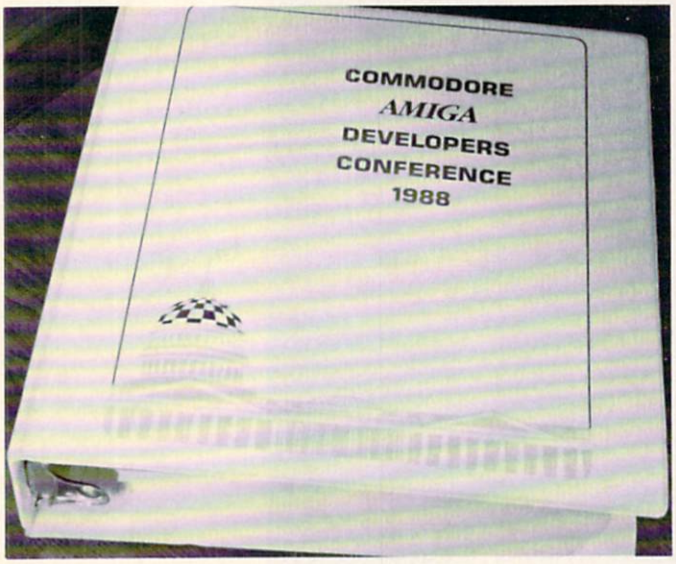
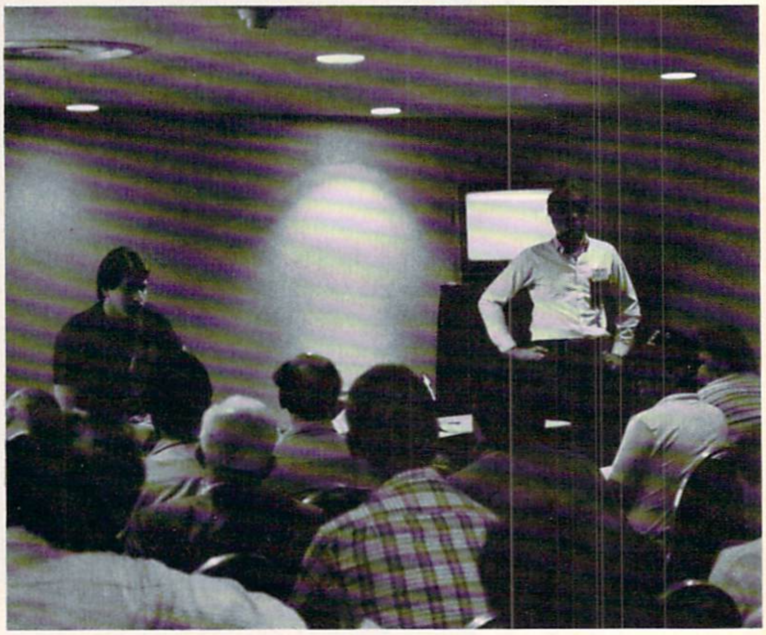
1988 Amiga Developers Conference of Sessions



The following is a short overview of most of the conferences and papers presented at the conference.


Bill Koester & R.J. Mical

Keynote Address
Dr. Henri Rubin, Chief Operating Officer at Commodore International Ltd., gave the opening keynote address covering "Commodore's objectives as Amiga technology evolves into new areas".

At the Session for New Amigans, Bill Koester (Commodore Amiga Technical Support), and RJ Mical (Commodore Consultant), spoke to beginner programmers about basic Amiga techniques dealing with Exec.

Commodore Amiga Hardware Engineers, Joe Augenbraun, Dave Haynie, and George Robbins held an open discussion on A500 Peripheral issues.

Jim Machraz and Dale Luck, Amiga Software Engineers, gave details on Copper operation and demonstrated the practicality of going directly to the hardware.

Dan Baker and Dan Schein's (CATS), seminar on starting out on the Amiga with 'C' covered setting up the compiler, using the CLI, Editors, and reference material.

Carolyn Scheppner, group leader (CATS), Gary Bonham of the SPARTA Corporation, and John Toebes of Lattice Inc. led a discussion of the current and proposed IFF forms.

Commodore notables, including Paul Higginbottom, Gail Wellington, and Rick Glover, presented trends in specific Amiga markets (North America, Europe, and Australia).

Jeff Porter, Director of Product Development and Andy Finkel, Manager of Amiga Software at Commodore, commented on new hardware and software developments.

Designing adaptable software for higher resolutions and the A2024, software and hardware engineers, Jim Mackraz and Hedley Davis could have helped you out.

Dan Baker's (CATS) conducted a seminar on programming sound and audio which covered I/O fundementals, multitasking and audio.

A discussion on bringing your product to market was given by John Cambell, Manager Worldwide Software and Product Support at Commodore.

Dave Haynie and Dale Luck, Amiga Sofware Engineers, discussed new math libraries and programming for 32-bit Amigas.

Tips on programming in 'C', Eric Lavitsky, Jim Goodnow, John Toebes, with Carolyn Scheppner.

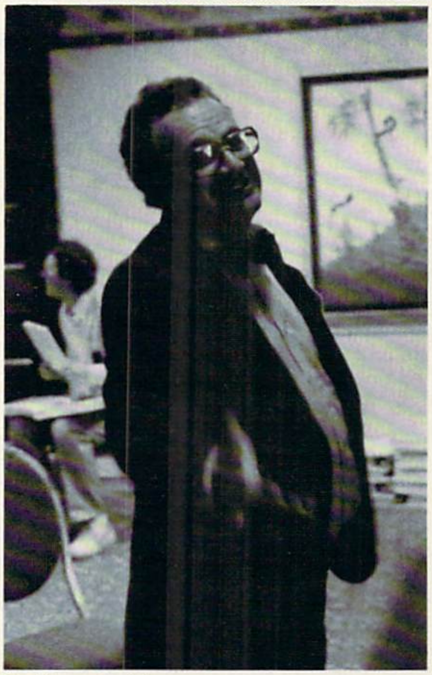
Amiga engineers, Bart Whitebook, Bob Burns, and Joe Augenbraun, spoke on V1.3 Kickstart and Autoboot.

Tom Rokicki of Radical Eye Software and Dale Luck Amiga Software Engineer helped Amiga users use a blitter better.

Another Commodore Software Engineer, David Berezowski, presented proper methods of writing V1.3 printer drivers and getting the most out of the improved printer device.

Friday April 29, 1988:

Gail Wellington & "friend"


Dr. Henry Rubin

Saturday April 30, 1988
Amiga Hardware Engineers, Dave Haynie, George Robbins, and Joe Augenbraun talked about basic specifications of A2000 slots.

A session on specific Amiga programming techniques (keymaps, BPTRs, ColorFonts, etc.) was presented by Andy Finkel, Amiga Software Manager and Bob Burns.

Fleishman Hillard Public Relations gave an "all you need to know about public relations" seminar.

Andy Finkel, Amiga Software Manager, and Bob Burns, Amiga Software Engineer, discussed proposals for mapping multiple parallel, serial, and similar ports into the Amiga.

West German Engineers, Dieter Priess and Wolf Schmidt, offered an overview of the Transputer project, and operating system.

A seminar on Assembler Language Programming was given by Steve Beats, Commodore Amiga Software Engineer.

JimMackraz and Bob Burns taught how to take control of the Amiga system and then give it back.

Amiga Software Engineer, Bart Whitebook, discussed creating your own libraries.

A session on new features of V1.3 preferences was introduced by Dave Berezowski and Rick Cotton, Amiga Software Engineers.

Andy Finkel, Jim Mackraz and others were part of a panel discussion on standardization of user interface.

A seminar that covered an overview of Service Functions, given by Torsten Burgdorf, West German Amiga Engineer, Bill Koester of CATS, and RJ Mical, also taught how to write Amiga Service.

Gail Wellington moderated a discussion on expanding your market to other countries.

An open forum on piracy, copy protection, and viruses was headed by John Cambell, Manager Worldwide Software and Product Support, Commodore International Ltd.

Amiga Software Engineers, Jim Mackraz, Dale Luck and Bart Whitebook described how to request and manage larger screens without compromising the system's integrity.

For writing handlers and filesystems Andy Finkel and Steve Beats, Commodore Amiga Software Engineer, filled us in.

Sunday May 1, 1988
Three informal sessions of conversations with the experts.

Summation given by Gail Wellington and speculation regarding the future. Fred Fish was honored for his efforts in the Amiga community with the first publicly presented "Fat Agnus" chip.

•AC•

NEW COMMODORE PRODUCTS PREVIEWED

THE COMMODORE AMIGA DEVELOPERS CONFERENCE 1988

A2024 Commodore Amiga High Resolution Monochrome Monitor
This monitor is compatible with Amiga 500, 1000, and 2000 computers having 512K chip memory and 1 Mb total RAM. 60 Hz (NTSC) 48 Hz (PAL, international) refresh rate. Cable to Amiga RGB (23 pin) port interface. Power, brightness, contrast, vertical hold, and vertical size external controls. 15" diagonal and 4 level monochrome (black, dk. gray, lt. gray, white).

A2300 Internal Genlock for Amiga 2000
Does Semi-Professional (non-broadcast) quality mixing of video sources and Amiga graphics/text on Amiga screen or video tape. Composite video input, via RCA jack Amiga computer RGB video via internal slot. Composite video output, via RCA jack RGB video, 1 volt to ohm load via 23 pin D subconnector. External video or combined Amiga video switch. Powered by Amiga computer system. Amiga 2000 video slot card.

68020 Processor Board for Amiga 2000
Provides alternate processor for faster operations and optimal math co-processor for further performance benefit. It is compatible with Amiga operating system and most application software. Powered by system. Full size Amiga 2000 86 pin slot card. 64K ROM. 2 or 4 Mb of 32 bit memory (autoconfigs.) 400% estimated performance increase. Motorola 68020, 14.3 MHz processor. 68881 floating point math and 68851 memory management co-processors.

A2090A Hard Disk Controller for Amiga 2000
Provides controller function for two ST506 hard disk drives. Autoboot capability. Built-in full SCSI interface for connection high speed peripherals. Amiga bus 100 pin card. Powered by system at 5 volts, 3 amps max. Up to 800ns/Byte (SCSI) and up to 1.6 us/BYTE (ST506) DMA transfer rate. 64 Byte FIFO RAM Memory real time buffer. 2 ST 506-compatible hard disk and SCSI (25 and 50 pin) interfaces. SCSI Interface: ANSI X3T9.2 compatible. Up to 10 Mbit/sec. transfer rate, Macintosh Plus compatible connector 50 pin (standard), 25 pin (additional).

2-8 Megabyte Memory Expansion Card for Amiga A2000
Provides capability of expanding to full memory config. with one board. Comes with 2Mb of memory and sockets for expansion to 4 or 8 Mb (autoconfigs.). Uses 1 Mb chips. Full size Amiga 100 pin slot card. Powered by system.

Bridgeboard (IBM-AT Compatible) for Amiga 2000
Provides an 80286 co-processor system with IBM-AT™ compatibility uses AutoConfig feature of the Amiga. Socket for 80287 math co-processor. Amiga bus (100 pin) and IBM-AT™ bus system cards.

DATA 80286 SIDE: 10MHZ clock speed. 1 Mb RAM and 16 KByte BIOS. MS-DOS 3.2 software. 1 internal 5 1/4" (1.2 MByte) and 3 1/2" (720KByte) interfaces. IBM-AT™ keyboard emulated on the Amiga Keyboard. Parallel Port (Centronics, IBM-AT™ compatible emulated on the Amiga). 3 IBM-PC-AT™ compatible full size slots.

DATA AMIGA SIDE: 64 KByte dual port RAM as inter-process buffer, 64 KByte dual-port scratch memory, interrupt logic, Janus emulation software InterSystem communication.

BUS INTERFACE: Full size Amiga 2000 card. Powered by system. Fast dual-port memory full speed CPU access during system DMA. Janus emulation software on 3 1/2" floppy included.

Professional Video Adapter for Amiga 2000
Provides professional quality Video interfacing (genlock), real time freeze frame, and digitizing of video images into Amiga pictures. Inputs: two-composite video RS-170A (via RCA jack). Output: composite video via RCA jack, RGB via 23 pin D connector. Powered by Amiga 2000. Card types: Amiga 2000 100 pin slot card, A2000 video slot card, freeze frame board, video interface board. Analog to digital signal conversion. Software: switches between video sources, between external and combined video. User selectable palates, digitized image control. Genlock syncs to external source, overlays Amiga graphics and displays or outputs as composite. Real time freeze frame.

ECS Enhanced Chip Set
Upgrade for A500 and two-layer board A2000. Set of 3 chips: Denise, Fat Agnus, Gary. Supports all current video modes, color resolutions, and 640x400 interlaced, 4 colors from 64. Extend memory addressable by color modes to 1 megabyte. Uses software to switch video mode within chipset from PAL to NTSC. Requires version 1.4 software and Bisync monitor.

Kickstart V1.3
ROM based update. Allows user to boot from suitable hard disk or other expansion device. Compatible with V1.2.

WORKBENCH V1.3 A Disk Based Update
Up to 7 times faster hard disk read/writes, up to 10 times faster hard disk directories, and a Disk Partition Limit raised to 2 Gigabytes. Printer: graphic printing up to 6 times faster; Amiga can now color-correct so a printed page looks like the screen; can ANTI-ALIAS graphic prints. Math Library: Faster library; CAD programs using the libraries speed up automatically.

Screen output is up 4 times faster. Recoverable RAM disk keeps its contents until the Amiga is turned off. Times-Roman, Helvetica, and Courier are standard Adobe screen fonts. AUX allows a second person to use the Amiga at the same time. Adds speech output to most programs. New Commands and Improved Commands.

Unix™ System V on the Amiga
A version of Unix system is available for the Amiga. Requires the optional A2620 board which contains the 68020 processor and the 68881 floating point co-processor and 68851 MMM. This board can be with up to four megabytes of memory which is accessed by the 68020 using a 32 bit data bus. The Amiga runs Unix System V, release 3, version 1, released from AT&T. It used a paged memory management model to allow for a virtual address space of a gigabyte. Streams are included along with the remote networked filesystem (RFS). An optimizing C compiler takes full advantage of the special 68020 instruction set and the 68881 floating point instructions. A responsive windowing system that fully uses the special purpose Amiga hardware has also been implemented. (UNIX™ is a registered trademark of AT&T)

Amiga™ Working Groups—Proposal and Discussion

Submitted by
Perry Kivolowitz
and Eric Lavitsky

1.0 Overview

This document shall serve to define the structure which will govern the formation and operation of Amiga™ Working groups.

The AWG Project is in its formative stages. The distribution of this document at the 1988 Commodore Amiga Developers Conference is intended to spark the interest and the input of the developer community at large. Please read this document and send us your feedback through the means provided.

2.0 Amiga Working Groups (AWG)

This section defines the concept and goals of the AWG Project.

2.1 Definition Of An Amiga Working Group

An AWG is a formalized group of developers sharing a strong interest in a specific area of research and development which may advance the state-of-the-art in Commodore Amiga software (or, to a lesser degree, hardware).

2.2 Goals Of An Amiga Working Group

The AWG project has the following goals:

A) To enhance the formal interchange of ideas and technology within the developer community (and from within Commodore-Amiga™ itself) specifically in the development, formalization, and publication of software standards (and to lesser degree hardware standards).

B) To focus the direction of participating developer research in order to more closely tie future product development to future directions of the Amiga market place (as globally defined by Commodore-Amiga).

C) To supplement and complement basic research and development being performed by Commodore-Amiga to the extent permitted by Commodore-Amiga.

D) To provide materials to be used to produce an annual or semi-annual Proceedings of Amiga Working Groups. These proceedings shall be distributed to every certified and commercial developer and shall contain the written culmination of the work performed by each AWG.

2.3 Ownership Of Work Performed By Amiga Working Groups

Any work performed by an AWG shall be the property of the developer community at large with the Amiga Steering Committee acting as the agent of the developer community.

The AWG Steering Committee shall grant free perpetual use licenses to any member of the developer community wishing to have access to or use of any material developed by the AWG project. No member of the developer community may be denied access to or use of any material developed by an AWG.

The purpose of the licensing procedure is twofold. First, to provide an owning entity so that the material produced by the AWG project will not technically be entered into the public domain. Second, to provide for a database of users and interested parties to further facilitate information flow.

2.4 Connection With Commodore-Amiga™

2.4.1 Use and Non-Use Of AWG Developed Material

It must be understood by all parties concerned that involvement of Commodore-Amiga in the AWG Project or in any specific AWG does not constitute any official endorsement of the work being performed by that group. Nor does it obligate Commodore-Amiga to use or not use any of the work performed by any group or any group member. Commodore-Amiga can, of course, have access to or use any material developed by the AWG Project perpetually without any financial liability.

2.4.2 Involvement Of Commodore-Amiga Staff In The AWG Project

Commodore-Amiga has expressed a commitment to provide two persons for the AWG Steering Committee. Apart from these two individuals, Commodore-Amiga staff will participate in specific working groups as interests and time may dictate.

3.0 Amiga Working Group Structure

3.1 AWG Steering Committee (AWGSC)

3.1.1 AWG Steering Committee Definition And Purpose

The AWG Steering Committee is the top most level of AWG Project structure. It shall serve several purposes:

A) It shall be the principal investment of Commodore-Amiga personnel time. Two Commodore-Amiga employees shall be designated to sit on the AWGSC. Through these individuals Commodore-Amiga will express its corporate wishes in matters of AWGSC discussion and also through these individuals information for individual AWGs requiring Commodore-Amiga input will be channeled.

B) The AWGSC shall be the sanctioning body for the creation of new working groups. The formation of working groups must be controlled for the following reasons:

1. To prevent duplication of effort.

2. In work areas which will require sanctioning by Commodore-Amiga: To channel effort into work areas in which Commodore-Amiga has interest rather than in areas which have no hope of being adopted by Commodore-Amiga.

3. To facilitate the collection of AWG results by the AWGSC for the purpose of producing the Proceedings.

4. To ensure that the work of the AWG will be available to all members of the developer community in a fair and equal manner.

C) The AWGSC shall be the issuing body of free perpetual use licenses governing access and use of material developed by the AWG Project.

D) The AWGSC shall collect, edit, and publish the results of all AWGs in an annual or semi-annual Proceedings Of Amiga Working Groups.

E) The AWGSC shall prepare and deliver a report to the developer community at all Developers Conferences summarizing the achievements of the AWG Project since the previous Developers Conference.

F) The AWGSC shall prepare a quarterly newsletter summarizing the achievements of the AWG Project in the absence of a Developers Conference during any given quarter. This newsletter shall be distributed with AmigaMail™.

G) The AWGSC shall be the arbitrating body in the settlement of any AWG membership disputes which cannot be settled internally to the working group. Please refer to section 3.2.2 for more information concerning this point.

3.1.2 Method For Governing The Steering Committee

The AWGSC shall conduct its own affairs based upon Robert's Rules of Order.

3.1.3 Steering Committee Structure

The AWGSC shall be composed of 5 members of the developer community and two members designated by Commodore-Amiga. By internal election one member shall be designated Chairperson and shall conduct meetings of the AWGSC under the principles of Robert's Rules Of Order.

Also by internal election the AWGSC shall elect one member to the position of Secretary. The AWGSC Secretary shall prepare minutes of AWGSC meetings in accordance with Robert's Rule Of Order.

3.1.4 Initial Composition Of The Steering Committee

The initial holders of the development seats on the Steering Committee shall be by election by the current members of the Steering Committee. That is, the members of the Steering Committee shall elect the newer members until all five developer seats have been filled.

3.1.5 Term Of Office And Election Method

Developer seats on the AWGSC shall come up for election after a one year term. The nomination and election process shall be conducted through AmigaMail. No more than one person from any one company can serve on the AWGSC at the same time.

3.1.6 By-Laws Of The Steering Committee

The initial AWGSC shall be obliged to prepare a set of by-laws which will fully define issues pertaining to Steering Committee membership and procedure.

3.1.7 Meetings Of The Steering Committee

Formal meetings of the AWGSC shall be held four times per year or more often if required. These meetings can be conducted in person if possible or on some electronic messaging system supporting real time group conferencing.

3.2 The Working Group

3.2.1 Definition And Purpose

As previously stated, the Amiga working group is a formal collection of members of the developer community sharing a common interest in a subject area as well as having the desire and commitment to invest time and effort in advancing the state-of-the-art in that subject area.

3.2.2 Membership In The Working Groups

Memberships in an AWG is open to any member of the developer community as defined by the Certified and Commercial developer list maintained by Commodore-Amiga. For reasons of practicality the individual working group shall be free to specify its operating size though it must be noted that this operating size cannot be used to prevent an interested party from joining the working group.

We must expect individual developers to join only those working groups which they are confident that they can and will be able to contribute. Purely for reasons of practicality the members of a working group shall be free to drop from its membership those persons deemed not to be contributing members.

In the event of membership disputes which cannot be settled from within the working group itself, the AWGSC shall act as the arbitrating body.

3.2.3 Working Group Structure

In the absence of any less formal method, the members of the working group shall elect a Chairperson. The Chair shall act as a liaison between the working group and the AWGSC for the purpose of conveying information to and from the working group and Commodore-Amiga (if no Commodore-Amiga employee chooses to fulfill this role directly). The Chair will oversee the work of the group and facilitate the collection of the groups results for publication in the Proceedings. The Chair shall also facilitate meetings of the group by whatever means are applicable.

Apart from a mandated Chairperson, the structure and running of the individual working group is left completely to the membership of the group with the expectation that the members of the group are committed to the ideas of the AWG Project (information interchange and technology development).

3.2.4 Duration Of Membership

There will be no formal limitation on membership in any AWG. Members may retire from the group at whatever time they choose.

3.2.5 Meetings Of The Working Groups

As with the Steering Committee, the working groups shall try to meet in person as often as possible on the occasion of such events as trade shows and conferences. The Steering Committee shall coordinate the reservation of space and time at such events.

However, it is expected that a substantial portion of the work of any group shall be exchanged among the group's members via an electronic messaging system.

For the time being, the messaging system of choice shall be the Byte Information Exchange (BIX) where many developers as well as Commodore-Amiga are either already members or in fact already run their own conferences.

Companies already having conferences of their own on BIX may host closed topics as the means of communications among group members.

3.2.6 Obligations Of The Working Groups

Each working group shall be required to prepare a summary and review of the group's work to be submitted to the AWGSC for publication in the Amiga Working Group Proceedings or other publication. Each group will also be required to submit interim status reports to the AWGSC for the purpose of gauging group process not so much by the AWGSC but by the working group itself.

Apart from the above obligations each working group is left substantially alone with regards to operations with the restriction that no developer may be excluded or favored over another.

4.0 Forming New Working Groups

For the AWG Project to be a success it must by its very nature encourage the formation of new and diverse working groups. For the results of a working group to be included in the Proceedings and enjoy other benefits of the AWG Project, the group must seek sanctioning by the AWGSC. Keep in mind that it is the job of the AWGSC to encourage the formation of new groups and not to hinder such activity.

Sanctioning by the AWGSC is an essential part of maintaining the overall organization of the AWG Project. Sanctioning will also serve several other aims:

First, it will prevent the duplication of work areas between working groups. Duplication of effort cannot serve the developer communities' best interests.

Second, should the desired work area require the involvement of Commodore-Amiga (in the form of incorporation of the results of the working group's labors into the standard "supported" Amiga environment) the AWGSC will solicit Commodore-Amiga's input right at the start before any work has been invested. Should Commodore-Amiga find that the work area conflicts with other work either planned or in progress the AWGSC will convey this information to the members of the prospective working group for their reassessment.

Lastly, the sanctioning process will allow the resources of the AWGSC to be brought to the aid of the group wishing to form a new working group. These resources include the publication of the new working group to attract interest and membership.

5.0 Initial Working Groups

Substantial discussion on the subjects of IFF standards for animation and desktop publishing are in progress currently through less formal means. The initial working groups could be formed around these subjects to bring a more formal footing to this research as well as benefit these already ongoing efforts by providing a broader venue for the work.

Other areas currently being discussed through informal means include: User Interfaces, IPC, Serial Device Extensibility and other topics. These subjects are also ripe for the formation of formal Amiga Working Groups.

If you are currently involved with any ongoing informal research, it is incumbent upon you to write us at the address given at the end of this document. Your participation in this project is particularly crucial in that you are already comfortable with the concept of working with a dispersed group and you've already demonstrated your interest in seeing some quality results come of your labors.

6.0 Current Status

The Amiga Working Group Project has been discussed informally for the past four months within Commodore-Amiga and within the developer community. This document is the result of these discussions. The fact that you are holding this paper in your hands right now attests to the determination of the developer community to join together for the advancement of the common good.

We have been granted a tentative commitment of resources to publish and distribute the Amiga Working Group Proceedings. Given our intention of producing a substantial volume of documents for the Proceedings, the tentative grant of resources to accomplish such a feat is a major step forward.

Also, we have been granted the tentative and cautious commitment of Commodore-Amiga to work with us to see if we can't get this project off the ground. If we can, then everyone will benefit. Given the general mumbling for an opportunity like this, if we don't capitalize upon this chance, we as a community will have sent a clear signal that we intend to stay small and isolated rather than become the progressive marketplace we can be.

7.0 We Need Your Support And Comments

Please put your thoughts to paper (and send the resulting sheets to the address given below). Specifically, we would like to know what you think of the AWG Project concept. Will you participate and in what way? What groups would you like to see formed? Would you help form them? And finally will you support us in concept?

Please send your views to:

CATS - Working Group Survey
Commodore Business Machines
1200 Wilson Drive
West Chester, Pa. 19380

Note: CATS has been kind enough to allow itself to be used as a collection point for your views. This does not imply any additional support or endorsement of the AWG Project except those which have been mentioned previously in this document.

8.0 Where Do We Go From Here

The nucleus of the AWGSC (the persons responsible for the creation of this document) together with interested parties from Commodore-Amiga and the developer community will collect your views as sent to the above address. Your input will be designated in a future edition of AmigaMail. The AWGSC will at the same time attempt to fill the remaining (four) developer seats (please indicate your serious desire to fill one of these seats in your input to us).

It is our goal that at least several working groups can be in place and actually produce results for publication by the time of the 1989 Developers Conference.

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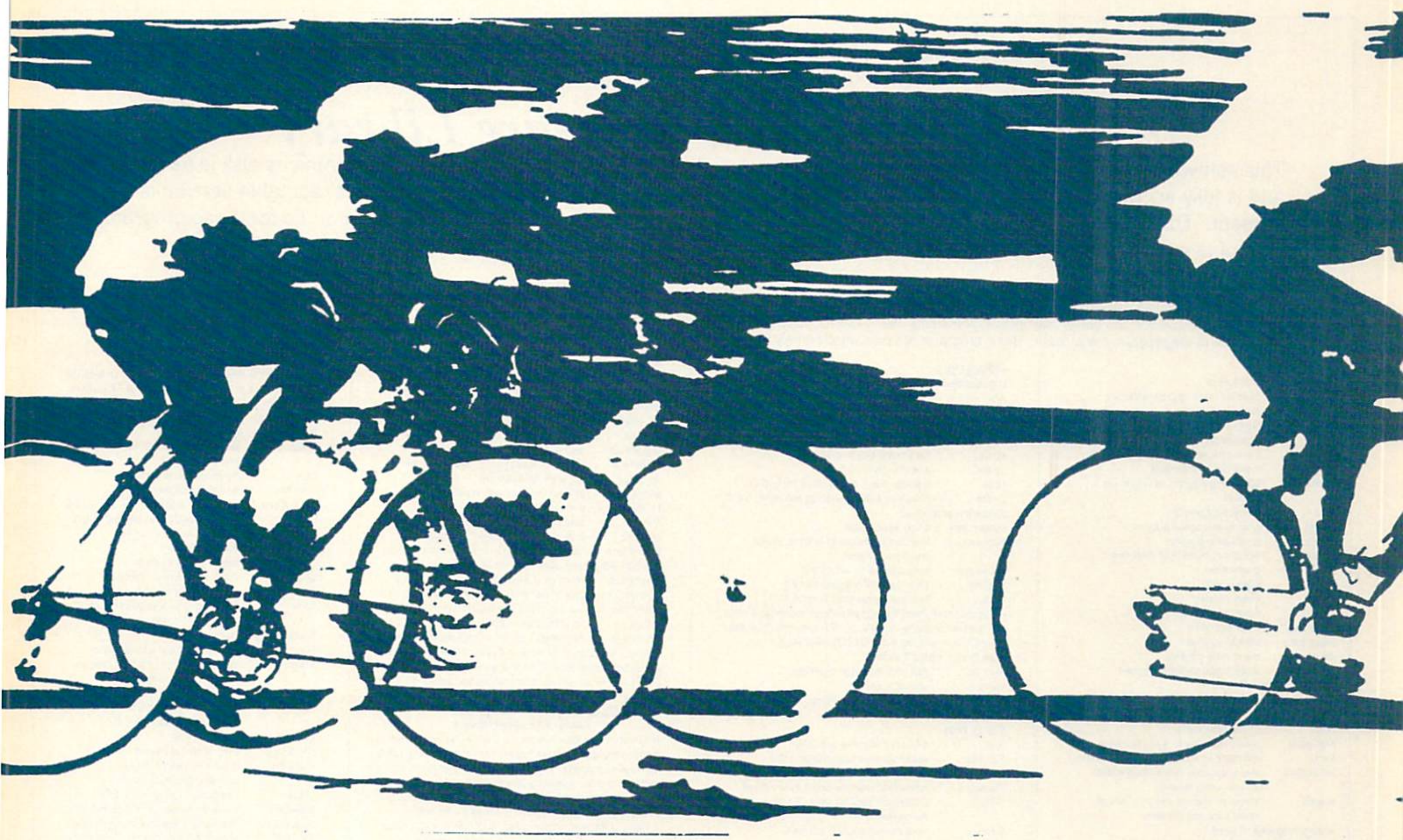

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The AMICUS & Fred Fish Public Domain Software Library

This software is collected from user groups and electronic bulletin boards around the nation. Each Amicus disk is nearly full, and is fully accessible from the Workbench. If source code is provided for any program, then the executable version is also present. This means that you don't need the C compiler to run these programs. An exception is granted for those programs only of use to people who own a C compiler.

The Fred Fish disk are collected by Mr. Fred Fish, a good and active friend of the Amiga.

Note: Each description line below may include something like 'S-O-E-D', which stands for 'source, object file, executable and documentation'. Any combination of these letters indicates what forms of the program are present. Basic programs are presented entirely in source code format.

AMICUS Disk 1

ABasic programs: Graphics

3DSolids	3d solids modeling prog. w/sample data files
Blocks	draws blocks
Cubes	draws cubes
Durer	draws pictures in the style of Durer
FScape	draws fractal landscapes
Hidden	3D drawing program, w/ hidden line removal
JPad	simple paint program
Optical	draw several optical illusions
PaintBox	simple paint program
Shuttle	draws the Shuttle in 3d wireframe
SpaceArt	graphics demo
Speaker	speech utility
Sphere	draws spheres
Spiral	draws color spirals
ThreeDee	3d function plots
Topography	artificial topography
Wheels	draws circle graphics
Xenos	draws fractal planet landscapes

ABasic programs: Tools

AddressBook	simple database program for addresses
CardFile	simple card file database program
Demo	multiwindow demo
KeyCodes	shows keycodes for a key you press
Menu	run many ABasic programs from a menu
MoreColors	way to get more colors on the screen at once, using aliasing
shapes	simple color shape designer SpeakIt speech and narrator demo

ABasic programs: Games

BrickOut	classic computer brick wall game
Othello	also known as 'go'
Saucer	simple shoot-em-up game
Spelling	simple talking spelling game
ToyBox	selectable graphics demo

ABasic programs: Sounds

Entertainer	plays that tune
HAL9000	pretends it's a real computer
Police	simple police siren sound
SugarPlum	plays "The Dance of the Sugarplum Fairies"

C programs:

ATerm	simple terminal program, S-E
cc	aid to compiling with Lattice C
decvnt	opposite of CONVERT for cross developers
Dotty	source code to the 'dotty window demo
echox	unix-style filename expansion, partial S,O-D
fasterfp	explains use of fast-floating point math
FixDate	fixes future dates on all files on a disk, S-E
freedraw	simple Workbench drawing prog.,S-E
GfxMem	graphic memory usage indicator, S-E
Grep	searches for a given string in a file with
docs.	ham shows off the hold-and-modify method of color generation
IBM2Amiga	fast parallel cable transfers between an IBM and an Amiga
Mandel	Mandelbrot set program, S-E
moire	patterned graphic demo, S-E
objfix	makes Lattice C object file symbols visible to Wack, S-E
quick	quick sort strings routine
raw	example sample window I/O
setlace	turns on interlace mode, S-E
sparks	qix-type graphic demo, S-E

Other executable programs:

SpeechToy	speech demonstration
WhichFont	displays all available fonts

Texts:

68020	describes 68020 speedup board from CSA
Aliases	explains uses of the ASSIGN command
Bugs	known bug list in Lattice C 3.02
CLICard	reference card for AmigaDOS CLI
CLICommands	guide to using the CLI
Commands	shorter guide to AmigaDOS CLI commands
EdCommands	guide to the ED editor
Filenames	AmigaDOS filename wildcard conventions
HalfBright	explains rare graphics chips that can do more colors
ModemPins	description of the serial port pinout
RAMdisks	tips on setting up your RAM: disk
ROMWack	tips on using ROMWack
Sounds	explanation of Instrument demo sound file format
Speed	refutation of Amiga's CPU and custom chip speed
WackCmds	tips on using Wack

AMICUS Disk 2

C programs:

alib	AmigaDOS object library manager , S-E
ar	text file archive program, S-E
fixobj	auto-chops executable files
shell	simple CLI shell, S-E
sq, usq	file compression programs, S-E
YachtC	a familiar game, S-E
Make	a simple 'make' programming utility, S-E
Emacs	an early version of the Amiga text editor, S-E-D

Assembler programs:

bsearch.asm	binary search code
qsort.asm	Unix compatible qsort() function, source and C test program
setjmp.asm	setjmp() code for Lattice 3.02
SVprintf	Unix system V compatible printf()
trees.o	Unix compatible tree() function, O-D

(This disk formerly had IFF specification files and examples. Since this spec is constantly updated, the IFF spec files have been moved to their own disk in the AMICUS collection.)

John Draper Amiga Tutorials:

Animate	describes animation algorithms
Gadgets	tutorial on gadgets
Menus	learn about Intuition menus

AMICUS Disk 3

C programs:

Xref	a C cross-reference gen., S-E
6bitcolor	extra-half-bright chip gfx demo, S-E
Chop	truncate (chop) files down to size, S-E
Cleanup	removes strange characters from text files
CR2LF	converts carriage returns to line feeds in Amiga files, S-E
Error	adds compile errors to a C file, S
Hello	window ex. from the RKM, S
Kermit	generic Kermit implementation, flakey, no terminal mode, S-E
Scales	sound demo plays scales, S-E
SkewB	Rubik cube demo in hi-res colors, S-E

AmigaBasicProgs(dir)

Automata	cellular automata simulation
CrazyEights	card game
Graph	function graphing programs
WitchingHour	a game

ABasiC programs:

Casino	games of poker, blackjack, dice, and craps
Gomoku	also known as 'othello'
Sabotage	sort of an adventure game

Executable programs:

Disassem	a 68000 disassembler, E-D
DpSlide	shows a given set of IFF pictures, E-D
Arrange	a text formatting program, E-D

Assembler programs:

Argoterm	terminal program with speech and Xmodem, S-E

AMICUS Disk 4 **Files from the original Amiga Technical BBS**

Note that some of these files are old, and refer to older versions of the operating system. These files came from the Sun system that served as Amiga technical support HQ for most of 1985. These files do not carry a warranty, and are for educational purposes only. Of course, that's not to say they don't work.

Complete and nearly up-to-date C source to 'image.ed', an early version of the Icon Editor. This is a little flaky, but compiles and runs.

An Intuition demo, in full C source, including files: demomenu.c, demomenu2.c, demoreq.c, getascii.c, idemo.c, idemo.guide, idemo.make, idemoall.h, nodos.c, and txwrite.c

addmem.c	add external memory to the system
bobtest.c	example of BOB use
consoleIO.c	console IO example
creaport.c	create and delete ports
creastdi.c	create standard I/O requests
creatask.c	creating task examples
diskio.c	example of track read and write
dotty.c	source to the 'dotty window' demo
dualplay.c	dual playfield example
flood.c	flood fill example
freemap.c	old version of 'freemap'
geltools.c	tools for VSprites and BOBs
gfxmem.c	graphic memory usage indicator
hello.c	window example from RKM
inputdev.c	adding an input handler to the input stream
joystik.c	reading the joystick
keybd.c	direct keyboard reading
layertes.c	layers examples
mousport.c	test mouse port
ownlib.c,	
ownlib.asm	example of making your own library with Lattice
paratest.c	tests parallel port commands
seritest.c	tests serial port commands
serisamp.c	example of serial port use
prinintr.c	sample printer interface code
prtbase.h	printer device definitions
regintes.c	region test program
setlace.c	source to interlace on/off program
setparallel.c	set the attributes of the parallel port
SetSerial.c	set the attributes (parity, data bits) of the
singplay.c	single playfield example
speechtoy.c	source to narrator and phonetics demo
timedely.c	simple timer demo
timer.c	exec support timer functions
timrstuf.c	more exec support timer functions
WhichFont.c	loads and displays all available system fonts

process.i and prtbase.i assmebler include files:

autorqstr.txt	warnings of deadlocks with autorequesters
consoleIO.txt	copy of the RKM console I/O chapter
diskfont.txt	warning of disk font loading bug
fullfunc.txt	list of #defines, macros, functions
inputdev.txt	preliminary copy of the input device chapter

License information on Workbench distribution license

printer pre-release copy of the chapter on printer drivers, from RKM 1.1 v11fd.txt 'diff' of .fd file changes from version 1.0 to 1.1

v28v1.diff 'diff' of include file changes from version 28 to 1.0

AMICUS Disk 5 **Files from the Amiga Link / Amiga Information Network**

Note that some of these files are old, and refer to older versions of the operating system. These files are from AmigaLink. For a time, Commodore supported Amiga Link, aka AIN, for online developer technical support. It was only up and running for several weeks. These files do not carry a warranty, and are for educational purposes only. Of course, that's not to say they don't work.

A demo of Intuition menus called 'menudemo', in C source

whereis.c	find a file searching all subdirectories
bobtest.c	BOB programming example
sweep.c	sound synthesis example

Assembler files:

mydev.asm	sample device driver
mylib.asm	sample library example
mylib.i	
mydev.i	
asmsupp.i	
macros.i	assembler include files

Texts:

amigatricks	tips on CLI commands
extdisk	external disk specification
gameport	game port spec
parallel	parallel port spec
serial	serial port spec
v1.1update	list of new features in version 1.1
v1.1h.txt	'diff' of include file changes from version

Files for building your own printer drivers, including dospecial.c, epsondata.c, init.asm, printer.c, printer.link, printertag.asm, render.c, and wait.asm. This disk does contain a number of files describing the IFF specification. These are not the latest and greatest files, but remain here for historical purposes. They include text files and C source examples. The latest IFF spec is elsewhere in this library.

AMICUS Disk 6 **IFF Pictures**

This disk includes the DPSlide program, which can view a given series of IFF pictures, and the 'showpic' program, which can view each file at the click of an icon. The pictures include a screen from ArticFox, a Degas dancer, the guys at Electronic Arts, a gorilla, horses, King Tut, a lighthouse, a screen from Marble Madness, the Bugs Bunny Martian, a still from an old movie, the Dire Straits moving company, a screen from Pinball Contruction Set, a TV newcaster, the PaintCan, a world map, a Porsche, a shuttle mission patch, a tyrannosaurus rex, a planet view, a VISA card, and a ten-speed.

AMICUS Disk 7 **DigiView HAM demo picture disk**

This disk has pictures from the DigiView hold-and-modify video digitizer. It includes the ladies with pencils and lollypops, the young girl, the bulldozer, the horse and buggy, the Byte cover, the dictionary page, the robot and Robert. This includes a program to view each picture separately, and all together as separate, slidable screens. The 'seeilbm' program, to turn any screen into an IFF picture.

AMICUS Disk 8

C programs:

Browse	view text files on a disk, using menus S-E-D
Crunch	removes comments and white space from C files, S-E
IconExec	EXECUTE a series of commands from Workbench S-E
PDScreen Dump	dumps Rastport of highest screen to printer
SetAlternate	sets a second image for an icon, when clicked once S-E
SetWindow	makes windows for a CLI program to run under Workbench S-E
SmallClock	a small digital clockin a window menu bar
Scrimper	the screen printer in the fourth AC S-E

Amiga Basic Programs:

(Note: Many of these programs are present on AMICUS Disk 1. Several of these were converted to Amiga Basic, and are included here.)

AddressBook	a simple address book database
Ball	draws a ball
Cload	program to convert Compuserve hex files to binary, S-D
Clue	the game, Intuiton driven
ColorArt	art drawing program
DeluxeDraw	the drawing program in the 3rd AC, S-D
Eliza	conversational computer psychologist
Othello	the game, as known as 'go'
RatMaze	3D ratmaze game
ROR	boggling graphics demo
Shuttle	draws 3D pictures of the space shuttle
Spelling	simple spelling program
YoYo	wierd zero-gravity yo-yo demo, tracks yo-yo to the mouse

Executable programs:

3Dcube	Modula-2 demo of a rotating cube
AltIcon	sets a second icon image, displayed when the icon is clicked
AmigaSpell	a slow but simple spell checker, E-D
arc	the ARC file compression progra must-have for telecom, E-D
Bertrand	graphics demo
disksalvage	prog. to rescue trashed disks, E-D
KwikCopy	a quick but nasty disk copy program: ignores errors, E-D
LibDir	lists hunks in an object file E-D
SaveILBM	saves any screen as IFF pic.E-D ??
ScreenDump	shareware screen dump prog, E only
StarTerm	version 2.0, term program, XmodemE-D

Texts:

LatticeMain	tips on fixing _main.c in Lattice
GDiskDrive	make your own 5 1/4 drive
GuruMed	explains the Guru numbers
Lat3.03bugs	bug list of Lattice C version 3.03
MForgeRev	user's view of the MicroForge HD
PrintSpooler	EXECUTE-based print spool prog.

.BMAP files:

These are the necessary links between Amiga Basic and the system libraries. To take advantage of the Amiga's capabilities in Basic, you need these files. BMAPs are included for 'dist', 'console', 'diskfont', 'exec', 'icon', 'intuition', 'layers', 'mathffp', mathieeedoubas', 'mathieeesingbas', 'mathtrans', 'potgo', 'timer' and 'translator'.

AMICUS Disk 9

Amiga Basic Programs:

FlightSim	simple flight simulator program
HuePalette	explains Hue, Saturation, & Intensity
Requester	ex. of requesters from Amiga Basic
ScrollDemo	demonstrates scrolling capabilities
Synthesizer	sound program
WorldMap	draws a map of the world

Executable programs:

Boing!	latest Boing! demo,with selectable speed,E
Brush2C	converts an IFF brush to C data instructions, initialization code, E
Brush2Icon	converts IFF brush to an icon, E
Dazzle	graphics demo, tracks to mouse, E
DeciGEL	assembler program for stopping 68010 errors, S-E-D
Klock	menu-bar clock and date display, E
life	the game of life, E
TimeSet	Intuition-based way to set the time & date
EMEmacs	another Emacs, more oriented to word processing, S-E-D
MyCLI	a CLI shell, works without the Workbench, S-E-D

Texts:

FnctnKeys	read function keys from Amiga Basic
HackerSin	explains how to win the game 'hacker'
Ist68010	guide to installing a 68010 in your Amiga
Boing!	latest Boing! demo,with selectablespeed, E
Brush2C	converts an IFF brush to C data instructions, initialization code, E
Brush2Icon	converts IFF brush to an icon, E
Dazzle	graphics demo, tracks to mouse, E
DeciGEL	assembler program for stopping 68010 errors, S-E-D
Klock	menu-bar clock and date display, E
life	the game of life, E
TimeSet	Intuition-based way to set the time date,
EMEmacs	another Emacs, more oriented to word processing, S-E-D
MyCLI	a CLI shell, works without the Workbench, S-E-D

For PDS orders, please use form on page 127

Texts:

FnctnKeys	explains how to read function keys from Amiga Basic
HackerSln	explains how to win the game 'hacker'
Ist68010	guide to installing a 68010 in your Amiga
PrinterTip	sending escape sequences to your printer
StartupTip	tips on setting up your startup-sequence file
XfmrReview	list of Transformer programs that work

Printer Drivers:

Printer drivers for the Canon PJ-1080A, the C Itoh Prowriter, an improved Epson driver that eliminates streaking, the Epson LQ-800, the Gemini Star-10, the NEC 8025A, the Okidata ML-92, the Panasonic KX-P10xx family, and the Smith-Corona D300, with a document describing the installation process.

AMICUS Disk 10 **Instrument sound demos**

This is an icon-driven demo, circulated to many dealers. It includes the sounds of an acoustic guitar, an alarm, a banjo, a bass guitar, a boink, a calliope, a car horn, claves, water drip, electric guitar, a flute, a harp arpegio, a kickdrum, a marimba, a organ minor chord, people talking, pigs, a pipe organ, a Rhodes piano, a saxophone, a sitar, a snare drum, a steel drum, bells, a vibrophone, a violin, a wailing guitar, a horse whinny, and a whiste.

AMICUS Disk 11

C programs

dirutil	Intuition-based, CLI replacement manager S-E
cpri	shows and adjusts priority of CLI processes, S-E
ps	shows info on CLI processes, S-E
vidtex	displays Compuserve RLE pics, S-E

AmigaBasic programs

pointered	pointer and sprite editor program
optimize	optimization ex ample from AC article
calendar	large, animated calendar, diary and date book program
amortize	loan amortizations
brushtoBOB	converts small IFF brushes to AmigaBasic BOB OBJECTS
grids	draw and play waveforms
hilbert	draws Hilbert curves
madlib	mad lib story generator
mailtalk	talking mailing list program
meadows3D	3D graphics program, from A C™ article
mousetrack	mouse tracking example in hires mode
slot	slot machine game
tictactoe	the game
switch	pachinko-like game
weird	makes strange sounds

Executable programs

cp	unix-like copy command, E
cls	screen clear, S-E
diff	unix-like stream editor uses 'diff' output to fix files
pm	chart recorder performances indicator

Assembler programs

cls	screen clear and CLI arguments example

Modula-2

trails	moving-worm graphics demo
caseconvert	converts Modula-2 keywords to uppercase
Forth	Breshehan circle algorithm example
Analyze	12 templates for the spreadsheet Analyze

There are four programs here that read Commodore 64 picture files. They can translate Koala Pad, Doodle, Print Shop and News Room graphics to IFF format. Getting the files from your C-64 to your Amiga is the hard part.

AMICUS Disk 12

Executable programs

blink	'alink' compatible linker, but faster, E-D
clean	spins the disk for disk cleaners, E-D
epsonset	sends Epson settings to PAR from menu E-D
showbig	view hi-res pics in low-res superbitmap, E-D
speaktime	tell the time, E-D
undelete	undeletes a file, E-D
cnvapldhm	converts Apple][low, medium and high res pictures to IFF, E-D
menued	menu editor produces C code for menus, E-D
quick	quick disk-to-disk nibble copier, E-D
quickEA	copies Electronic Arts disks, removes protection, E-D
txed 1.3	demo of text editor from Microsmiths,E-D

C programs

spin3	rotating blocks graphics demo, S-E-D
popcli	start a new CLI at the press of a button, like Sidekick, S-E-D
vsprite	VSprite example code from Commodore, S-E-D
AmigaBBS	Amiga Basic bulletin board prog., S-D

Assembler programs

star10	makes star fields like Star Trek intro,S-E-D

Pictures

Mount Mandelbrot	3D view of Mandelbrot set
Star Destroyer	hi-res Star Wars starship
Robot	robot arm grabbing a cylinder

Texts

vendors	Amiga vendors, names, addresses
cardco	fixes to early Cardco memory boards
cinclude	cross-reference to C include files
mindwalker	clues to playing the game well
slideshow	make your own slideshows from the Kaleidoscope disk

AMICUS Disk 13

Amiga Basic programs

Routines from Carolyn Scheppner of CBM Tech Support, to read and display IFF pictures from Amiga Basic. With documentation. Also included is a program to do screen prints in Amiga Basic, and the newest BMAP files, with a corrected ConvertFD program. With example pictures, and the SaveILBM screen capture program.

Routines to load and play FutureSound and IFF sound files from Amiga Basic, by John Foust for Applied Visions. With documentation and C and assembler source for writing your own libraries, and interfacing C to assembler in libraries. With example sound.

Executable programs

gravity	Sci Amer Jan 86 gravitation graphic simulation, S-E-D

Texts

MIDI	make your own MIDI instrument interface, with documentation and a hi-res schematic picture.

AMICUS Disk 14

Several programs from Amazing Computing issues:

Tools

Dan Kary's	C structure index program, S-E-D

Amiga Basic programs:

BMAP Reader	by Tim Jones
IFFBrush2BOB	by Mike Swinger
AutoRequester	example
DOSHelper	Windowed help system for CLI commands, S-E-D
PETrans	translates PET ASCII files to ASCII files, S-E-D
C Squared	Graphics program from Scientific American, Sept 86, S-E-D
crlf	adds or removes carriage returns from files, S-E-D
dpdecode	decrypts Deluxe Paint, remo
ves copy	protection, E-D
queryWB	asks Yes or No from the user returns exit code, S-E
vc	VisiCalc type spreadsheet, no mouse control, E-D
view	views text files with window and
slider	gadget, E-D

Oing, Sproing, yaBoing, Zoing are sprite-based

Boing! style	demos, S-E-D

CLIClock, sClock, wClock are window border clocks, S-E-D

Texts

An article on long-persistance phospor monitors, tips on making brushes of odd shapes in Deluxe Paint, and recommendations on icon interfaces from Commodore-Amiga.

AMICUS Disk 15

The C programs include:

'pr'	a file printing utility, which can print files in the background, and with line numbers and control character filtering.
'fm'	displays a chart of the blocks allocated on a disk.
'Ask'	questions an 'execute' file, returns an error code to control the execution in that batch file
'Stat'	an enhanced version of AmigaDOS 'status' command.
'Dissolve'	random-dot dissolve demo displays IFF picture slowly, dot by dot, in a random fashion.
'PopCLI2'	invoke new CLI window at the press of a key.

The executable programs include:

'Form'	file formatting program through the printer driver to select print styles
'DiskCat'	catalogs disks, maintains, sorts,merges lists of disk files
'PSound'	SunRize Industries' sampled sound editor & recorder
'Iconmaker'	makes icons for most programs
'Fractals'	draws great fractal seascapes and mountain scapes.
'3D Breakout'	3D glasses, create breakout in a new dimension
'AmigaMonitor'	displays lists of open files,
memory use,	tasks, devices and ports in use.
'Cosmoroids'	version of 'asteroids' for the Amiga.
'Sizzlers'	high resolution graphics demo written in Modula 2.

Texts:

'ansi.txt'	explains escape sequences the CON: device responds to.
'FKey'	includes template for making paper to sit in the tray at the top of the Amiga keyboard.
'Spawn'	programmer's document from Commodore

Amiga, describs ways to use the Amiga's multitasking capabilities in your own programs.

AmigaBasic programs:

'Grids'	draw sound waveforms, and hear them played.
'Light'	a version of the Tron light-cycle video game.
'MigaSol'	a game of solitaire.
'Stats'	program to calculate batting averages
'Money'	"try to grab all the bags of money that you can."

AMICUS 15 also includes two beautiful IFF pictures, of the enemy walkers from the ice planet in Star Wars, and a picture of a cheetah.

AMICUS Disk 16

'Juggler' demo by Eric Graham, a robot juggler bouncing three mirrored balls, with sound effects. Twenty-four frames of HAM animation are flipped quickly to produce this image. You control the speed of the juggling. The author's documentation hints that this program might someday be available as a product.

IFF pictures

parodies of the covers of Amiga World and Amazing Computing magazines.

C programs:

'Inputhandler'	example of making an input handler.
'FileZap3'	binary file editing program
'ShowPrint'	displays IFF picture, and prints it.
'Gen'	program indexes and retrieves C structures and variables declared in the Amiga include file system.

Executable Programs:

'FixHunk2'	repairs an executable program file for expanded memory
'ms2smus'	converts Music Studio files to IFF standard 'SMUS' format. I have heard this program might have a few bugs, especially in regards to very long songs, but it works in most cases.
'Missile'	Amiga version of the 'Missile Command' video game,

This disk also contains several files of scenarios for Amiga Flight Simulator II. By putting one of these seven files on a blank disk, and inserting it in the drive after performing a special command in this game, a number of interesting locations are preset into the Flight Simulator program. For example, one scenario places your plane on Alcatraz, while another puts you in Central Park

AMICUS Disk 17

Telcommunications disk whuch contains six terminal programs.

"Comm" V1.33	term prog. with Xmodem, WXmodem,
"ATerm" V7.2	term prog. includes Super Kermit
"VT-100"V2.6	Dave Wecker's VT-100 emulator with Xmodem,Kermit, and scripting
"Amiga Kermit"	V4D(060) port of the Unix C-Kermit
"VTek" V2.3.1	Tektronix graphics terminal emulator based on the VT-100 prog. V2.3 and contains latest 'arc' file compression
"AmigaHost"	V0.9 for Compuserve. Includes RLE graphics abilities & CIS-B file transfer protocol.
"FixHunk"	expansion memory necessity
"FixObj"	removes garbage characters from modem received files
"Txt"	filters text files from other systems to be read by the Amiga E.C.
"addmem"	executeable version for use with mem expansion article in AC v2..1
'arc'	file documentation and a basic tutorial on un 'arc'ing files
"arcre"	for makeing "arc" files E.C.

AMICUS Disk 18

Logo	Amiga version of the populacomputer language, with example programs, E-D
Tv*Text	Demo version of the TV*Text character generator
PageSetter	Freely distributable versions of the updated PagePrint and PageIFF programs for the PageSetter desktop publishing package.
FullWindow	Resizes any CLI window using only CLI commands, E-D
Life3d	3-D version of Conway's LIFE program, E-D
Defdisk	CLI utility to re-assign a new Workbench disk, S-E-D
Calendar.WKS	Lotus-compatible worksheet that makes calendars
SetKey	Demo of keyboard key re-programmer, with IFF picture to make function key labels, E-D
VPG	Video pattern generator for aligning monitors, E-D
HP-10C	Hewlett-Packard-like calculator, E-D
SetPrefs	Change the Preferences settings on the fly, in C, S-E-D
StarProbe	Program studies stellar evolution. C source included for Amiga and MS-DOS, S-E-D
ROT	C version of Colin French's AmigaBasic ROT program from Amazing Computing. ROT edits and displays polygons to create three dimensional objects. Up to 24 frames of animation can be created and displayed. E-D
Scat	Like Ing, windows on screen run away from the mouse, E-D
DK	Decays" the CLI window into dust, in Modula 2, S-E-D
DropShadow2	Adds layered shadows to Workbench windows, E-D

AMICUS Disk 19

This disk carries several programs from Amazing Computing. The IFF pictures on this disk include the Amiga Wake part T-shirt logo, a sixteen-color hi-res image of Andy Griffith, and five Amiga Live! pictures from the Amazing Stories episode that featured the Amiga.

Solve	Linear equation solver in assembly language, S-E-D
Gadgets	Bryan Catley's AmigaBasic tutorial,
Household	Bryan Catley's AmigaBasic household inventory program, S-D
Waveform	Jim Shields' Waveform WoAmigaBasic, S-D
DiskLib	John Kennan's AmigaBasic disk librarian program, S-D
Subscripts	Ivan Smith's AmigaBasic subscript example, S-D
String, Boolean	C programs and executables for Harriet Maybeck Tolly's Intuition tutorials, S-E-D
Skinny C	Bob Riemersma's example for making small C programs, S-E-D
COMAL.h	Make C look like COMAL header file,
EmacsKey	Makes Emacs function key definitons by Greg Douglas, S-D
AMon 1.1	Snoop on system resource use, E-D
BTE	Bard's Tale character editor, E-D
Size	CLI program shows the size of a given set of files, E-D
WinSize	CLI window utility resizes current window, S-E-D

AMICUS Disk 20

Compactor, Decoder Steve Michel AmigaBasic tools, S-D

BobEd	BOB and sprite editor written in C,S-E-D
SpriteMasterII	Sprite editor and animator by Brad Kiefer, E-D
BltLab	Blitter chip exploration C program by Tomas Rokicki, S-E-D
FPic	Image processing program by Bob Bush loads and saves IFF images, changes them with several techniques, E-D
Bankn	Complete home banking program, balance your checkbook! E-D

AMICUS Disk 21

Target	Makes each mouse click sound like a gunshot, S-E-D
Sand	Simple game of sand that follows the mouse pointer, E-D
PropGadget	Harriet Maybeck Tolly's proportional gadget example, S-E
EHB	Checks to see if you have extra-half-bright graphics, S-E-D
Piano	Simple piano sound program
CelScripts	Makes cel animation scripts for Aegis Animator, in AmigaBasic

This disk has electronic catalogs for AMICUS disks 1 to 20 and Fish disks 1 to 80. They are viewed with the DiskCat program, included here.

AMICUS Disk 22

Cycles	Light cycle game, E-D
Show_PrintII	Views and prints IFF pictures, including larger than screen
PrtDrvGen2.3	Latest version of a printer driver generator
Animations	VideoScape animations of planes and boing ball
Garden	Makes fractal gardenscapes
BasicSorts	Examples of binary search and insertion sort in AmigaBasic

AMICUS Disk 23

An AMICUS disk completely dedicated to music on the Amiga. This disk contains two music players, songs, instruments, and players to bring the thrill of playing "Big Sound" on your Amiga

Instruments	a collection of 25 instruments for playing and creating music. The collection ranges from Cannon to Marimba
List INSTR	program to list the instruments DMCS will not load as well as list the origins for any instrument.
Music	a collection of 14 Classical pieces
1812Overture	The 16 minute classical feature complete with Cannon!

Three Amiga Music Players:

SMUSPlay
MusicCraft2SMUS
MusicStudio2SMUS

AMICUS Disk 24

Sectorama	A disk sector editor for any AmigaDOS file-structured device, recover files from a trashed hard disk. By David Joiner of MicroIllusions
Iconize	Reduces the size of IFF images, companion program, Recolor, remaps the palette colors of one picture to use the palette colors of another. Using these programs and a tool to convert IFF brushes to Workbench icons, make icons look like miniatures of the pictures.
CodeDemo	Modula-2 program converts assembler object files to inline CODE statements. Comes with a screen scrolling example
AmiBug	Workbench hack makes the same fly walk across the screen at random intervals. Otherwise, completely harmless.
BNTools	Three examples of assembly language code from Bryce Nesbitt: 1. SetLace,prog to switch interlace on&off. 2. Why, replace AmigaDOS CLI Why 3. LoadIt, prog to load a file into memory until a reboot. (Only the most esoteric hackers will find LoadIt useful.)
Monolace	CLI program resets Preferences to several colors of monochrome & interlace screens. C source is included, works with DisplayPref, a CLI program which displays the current Preferences settings.
BoingMachine	A ray-traced animation of a perpetual motion Boing-making machine, includes the latest version of the Movie program, which has the ability to play sounds along with the animation. By Ken Offer
Daisy	Example of using the translator and narrator devices to make the Amiga talk. It is written in C.
QuickFlix	Script-driven animation and slideshow program flips through IFF images.
BMon	System monitor AmigaBasic program ; perform simple manipulations of memory.
Moose	Random background program, a small window opens with a moose resembleing Bullwinklesaying witty phrases user definable.
DGCS	Deluxe Grocery Construction Set, simple Intuition-based prog for assembling and printing a grocery list.
The Virus Check	directory holds several programs relating to the software virus that came to the US from pirates in Europe as detailed in Amazing Computing V2.12. Bill Koester's full explanation of the virus code is included. One program checks for the software virus on a Workbench disk; the second program checks for the virus in memory, which could infect other disks.

AMICUS Disk 25

Nemesis	Graphics demo pans through space towards the mythical dark twin of the sun with wonderful music and space graphics.
The KickPlay	directory holds text that describes several patches to the Kickstart disk. For Amiga 1000 hackers who feel comfortable patching a disk in hexadecimal, KickPlay offers the chance to automatically do an ADDMEM for old expansion memory, as well as the ability to change the picture of the "Insert Workbench" hand. A program is also included for restoring the correct checksum of the Kickstart disk.
KeyBird	BASIC prog edits keymaps, adjust the Workbench keymaps or create your own.

8ColorWB	Modifies the Workbench so three bitplanes are used, icons can have eight colors, instead of four, eight-color icons are included. Public domain program "zapicon" or "brush2icon" converts eight-color IFF brushes to icons, to use Deluxe Paint to make icons for this new Workbench.
BrushIcon	Converts brushes to icons (bizarr docs).
Egraph	Graphing prog reads [x,y] values from a file and displays them on the screen, similar to the same-named Unix program.
Keep 1.1	Message-managing program for telecommunications, lets you save messages from an online transcript to another file, understands the message format of the national networks and several types of bulletin board software. Moves through the transcript and save messages
Kill.fastdir	Speed up directory access, it creates a small file in each directory on a disk which contains the information about the files, will also remove all the "fastdir" files from each directory. by CLImate's authors

The LaceWB program changes between interlace and non-interlace Workbench. Previously, you were forced to reboot after changing Preferences to an interlaced screen. This program flips between the normal and extended screen heights.

PW_Utility	A shareware utility for ProWrite users, changes margin settings and font types.
Guru	A CLI program, prints out probable causes for Guru mediations; C source included.
DiskWipe	Latest from Software Distillery, removes files from directories or disk drives, much faster than "delete."
Snow	AmigaBasic makes snowflake designs.
Mlist	Mailing list database.
Softballstats	Maintain softball statistics/ team records.
Dodge	Short Modula-2 program moves the Workbench screen around after a period of time, prevents monitor burn-in.

AMICUS Disk 26

Todor Fay's SoundScape module code from his Amazing Computing articles. The source to Echo, Chord, TX, and VU is included. The Lattice and Manx C source code is here, along with the executable modules.

ImageMaker	Interesting tool edits Image structures for C, loads & saves C code directly.
Claz2	Update of prog to convert IFF images to PostScript files for printing on laser printers
SDBackup	Hard disk backup prog with Lempel-Ziv compression to reduce the necessary number of disks.
TCB	Prints information about tasks and processes in the system; assembler source is included.
FunBut	Lets a function key act like a rapid series of left mouse button events.
DC	A handy program for people who use an Amiga 1020 5 1/4 inch drive as an AmigaDOS floppy. A Workbench program that sends a DiskChange signal to the operating system: instead of typing "diskchange df2:" over and over again, just click on the icon. C source included.
System config	File makes screen 80 columns wide of text in the Scribble! word processor.
Dick2Ram	2 programs to move the Scribble! spelling dictionary to and from the RAM disk.
Lexical	Analyzes a text file and gives the Gunning-Fog, Flesch, and Kincaid indices which measure readability.
HexDump	Modula-2 program to display memory locations in hexadecimal.
Tartan	AmigaBasic; design Tartan plaids.
DirMaster	Disk catalog program.
BMP	plays 8SVX sampled sounds in the background while something else is happening in the Amiga, as your Amiga is booting, for example.
ShowPt	CLI program changes your pointer to a given pointer.

AMICUS 26 also has a collection of mouse pointers, & Workbench program to display them

Fred Fish Public Domain Software

Fred Fish Disk 1:

amigademo	Graphical benchmark for comparing amigas.
amigaterm	simple communications program with Xmodem
balls	simulation of the "kinetic thingy" with balls on strings
colorful	Shows off use of hold-and-modify mode.
dhrystone	Dhrystone benchmark program.
dotty	Source to the "dotty window" demo on the Workbench disk.
freedraw	A small "paint" type program with lines, boxes, etc.
gad	John Draper's Gadget tutorial program
gfxmem	Graphical memory usage display prog.
halfbrite	demonstrates "Extra-Half-Brite" mode, if you have it
hello	simple window demo
latffp	accessing the Motorola Fast Floating Point library from C
palette	Sample prog. to design color palettes.
trackdisk	Demonstrates use of the trackdisk driver.
requesters	John Draper's requester tutorial and example program.
speech	Sample speech demo program. Stripped down "speechtoy".
speechtoy	Another speech demo program.

Fred Fish Disk 2:

alib	Object module librarian.
cc	Unix-like frontend for Lattice C compiler.
dbug	Macro based C debugging package. Machine independent.
make	Subset of Unix make command.
make2	Another make subset command.
microemacs	Small version of emacs editor, with macros, no extensions
portar	Portable file archiver.
xrf	DECUS C cross reference utility.

Fred Fish Disk 3:

gothic	Gothic font banner printer.
roff	A "roff" type text formatter.
ff	A very fast text formatter
cforth	A highly portable forth implementation. Lots of goodies.
xlisp	Xlisp 1.4, not working correctly.

Fred Fish Disk 4:

banner	Prints horizontal banner
bgrep	A Boyer-Moore grep-like utility
bison	CNU Unix replacement 'yacc', not working.
bm	Another Boyer-Moore grep-like utility
grep	DECUS grep
kermit	simple portable Kermit with no connect mode.
MyCLI	Replacement CLI for the Amiga. V. 1.0
mandel	A Mandelbrot set program, by Robert French and RJ Mical

Fred Fish Disk 5

cons	Console device demo program with supporting macro routines.
freemap	Creates a visual diagram of free memory
input.dev	sample input handler, traps key or mouse events
joystick	Shows how to set up the gameport device as a joystick.
keyboard	demonstrates direct communications with the keyboard.
layers	Shows use of the layers library
mandelbrot	IFF Mandelbrot program
mouse	hooks up mouse to right joystick port
one.window	console window demo
parallel	Demonstrates access to the parallel port.
printer	opening and using the printer, does a screen dump, not working
print.support	Printer support routines, not working.
proctest	sample process creation code, not working
region	demos split drawing regions
samplefont	sample font with info on creating your own
serial	Demos the serial port
singlePlayfield	Creates 320 x 200 playfield
speechtoy	latest version of cute speech demo
speech.demo	simplified version of speechtoy, with IO requests
text.demo	displays available fonts
timer	demos timer.device use
trackdisk	demos trakcdisk driver

Fred Fish Disk 6:

compress	like Unix compress, a file squeezer
dclock	analog clock impersonator
microemacs	upgraded version of microemacs from disk 2
mult	removes multiple occuring lines in files
scales	demos using sound and audio functions
setparallel	Allows changing parallel port parameters
setserial	Allows changing serial port parameters.
sortc	quicksort based sort program, in C
stripc	Strips comments and extra whitespace from C source

Fred Fish Disk 7:

This disk contains the executables of the game Hack V 1.0.1.

Fred Fish Disk 8:

This disk contains the C source to Hack on disk 7.

Fred Fish Disk 9:

moire	Draws moire patterns in black and white
MVP-FORTH	Mountain View Press Forth, version 1.00.03A. A shareware version of FORTH from Fantasia Systems.
proff	a more powerful text formatting program
setlace	Prog to toggle interlace mode on and off
skewb	a rubic's cube type demo
sparks	moving snake Graphics demo

Fred Fish Disk 10:

conquest	An interstellar adventure simulation game
dehex	convert a hex file to binary
filezap	Patch program for any type of file.
fixobj	Strip garbage off Xmodem transferred files.
iff	Routines to read and write iff format files.
ld	simple directory program
ls	Minimal UNIX ls, with Unix-style wildcarding, in C
sq,usq	file squeeze and unsqueeze
trek73	Star Trek game
yachtc	Dice game.

Fred Fish Disk 11:

dpslide	slide show program for displaying IFF images with miscellaneous pictures

Fred Fish Disk 12:

amiga3d	Shows a rotating 3 dimensional solid "Amiga sign".
ArgoTerm	a terminal emulator program, written in assembler
arrow3d	Shows a rotating 3 dimensional wire frame arrow.
ld4	directory listing program
IconExec	
SetWindow	two progs for launching progs from Workbench, presently only works under CLI.
SetAlternate	Makes an icon show a second image when clicked once
StarTerm	terminal emulator, with ASCII Xmodem, dialer, more.

Fred Fish Disk 13:

A Bundle of Basic programs, including:

Jpad	toybox	ezspeak	mandlebrot
xmodem	3dsolids	addbook	algebra
ror	amgseq1	amiga-copy	band
bounce	box	brickout	canvas
cardfi	circle	colorcircles	Copy
cubes1	cutpaste	datedogstar	
dragon	draw	dynamictriangle	
Eliza	ezterm	fillibuster	fractal
fscape	gomoku	dart	haiku
hal9000	halley	hauntedM	hidden
join	loz	mandel	menu
minipaint	mouse	Orthello	patch
pena	pinwheel	gboxrandom-circles	
Readme	rgb	rgbtest	Rord
sabotage	salestalk	shades	shapes
shuttle			
sketchpad	spaceart	speakspeach	
speecheasy	spell	sphere	
spiral	striper	superpad	suprshr
talk	terminal		
termtest	tom	topography	triangle
wheels	xenos	xmostriper	

(note: some programs are Abasic, most are Amigabasic, and some programs are presented in both languages)

Fred Fish Disk 14:

amiga3d	update of #12, includes C source to a full hidden surface removal and 3D graphics
beep	Source for a function that generates a beep sound
dex	extracts text from within C source files
dimensions	demonstrates N dimensional graphics
filezap	update of disk 10, a file patch utility
gfxmem	update of disk 1, graphic memory usage indicator
gi	converts IFF brush files to Image struct, in C text.
pdterm	simple ANSI VT100 terminal emulator, in 80 x 25 screen
shell	simple Unix 'csh' style shell
termcap	mostly Unix compatible 'termcap' implementation.

Fred Fish Disk 15:

Blobs	graphics demo, like Unix 'worms'
Clock	simple digital clock program for the title bar
Dazzle	An eight-fold symmetry dazzler program. Really pretty!
Fish	double buffered sequence cycle animation of a fish
Monopoly	A really nice monopoly game written in AbasiC.
OkidataDump	Okidata ML92 driver and WorkBench screen dump program.
Polydraw	A drawing program written in AbasiC.
Polyfractals	A fractal program written in AbasiC.

Fred Fish Disk 16:

A complete copy of the latest developer IFF disk

Fred Fish Disk 17:

The NewTek Digi-View video digitizer HAM demo disk

Fred Fish Disk 18:

AmigaDisplay	dumb terminal program with bell, selectable fonts
Ash	Prerelease C Shell-like shell program, history, loops, etc.
Browser	wanders a file tree, displays files, all with the mouse
MC68010	docs on upgrading your Amiga to use a MC68010
Multidim	rotate an N dimensional cube with a joystick
PigLatin	SAY command that talks in Pig Latin
Scrimper	Screen image printer
Xlisp1.6	source, docs, and execut for a Lisp interpret.

Fred Fish Disk 19:

BlackJack	text-oriented blackjack game
JayMinerSlides	Slides by Jay Miner, Amiga graphics chip designer, showing flowchart of the Amiga internals, in 640 x 400.
Keymap_Test	test program to test the key mapping routines
LockMon	Find unclosed file locks, for programs that don't clean up.

Fred Fish Disk 20:

AmigaToAtari	converts Amiga object code to Atari form
DiskSalv	program to recover files from a trashed AmigaDOS disk.
Hash	example of the AmigaDOS disk hashing function
Hd	Hex dump utility ala Computer Language magazine, April 86
MandelBrots	Mandelbrot contest winners
MultiTasking	Tutorial and examples for Exec level multitasking
Pack	strips whitespace from C source
PortHandler	sample Port-Handler program that performs. Shows BCPL environment
Random	Random number generator in assembly, for C or assembler.
SetMouse2	sets the mouse port to right or left
SpeechTerm	terminal Emulator with speech capabilities, XModem
TxEd	Demo editor from Microsmith's Charlie Heath

Fred Fish Disk 21

This is a copy of Thomas Wilcox's Mandelbrot Set Explorer disk. Very good!

Fred Fish Disk 22

This disk contains two new "strains" of microemacs.

Lemacs	version 3.6 by Daniel Lawrence. For Unix V7, BSD 4.2, Amiga, MS-DOS, VMS. Uses Amiga function keys, status line, execute, startup files, more.
Pemacs	By Andy Poggio. New features include <ALT> keys as Meta keys, mouse support, higher priority, backup files, word wrap, function keys.

Fred Fish Disk 23

Disk of source for MicroEmacs, several versions for most popular operating systems on micros and mainframes. For people who want to port MicroEmacs to their favorite machine.

Fred Fish Disk 24:

Conques	interstaller adventure simulation game
Csh	update to shell on Disk 14, with built in commands,named variables substitution.
Modula-2	A pre-release version of the single pass Modula-2 compiler originally developed for MacIntosh at ETHZ. This code was transmitted to the AMIGA and is executed on the AMIGA with a special loader. Binary only.

Fred Fish Disk 25

Graphic Hack	A graphic version of the game on disks 7 and 8. This is the graphics-oriented Hack game by John Toebes. Only the executable is present.

Fred Fish Disk 26

UnHunk	Processes the Amiga "hunk" loadfiles. Collect code, data, and bss hunks together, allows individual specificato of code, data, and bss origins, and generates binary file with format reminiscent of Unix "a.out" format. The output file can be easily processed by a separate program to produce Motorola "S-records" suitable for downloading to PROM programmer. By Eric Black.
C-kermit	Port of the Kermit file transfer program and server.
Ps	Display and set process priorities
Archx	Yet another program for bundling up text files and mailing or posting them as a single file unit.

Fred Fish Disk 27

ABdemos	Amiga Basic demos; Caroly Scheppner.
NewConvertFD	creates .bmaps from fd files.
BitPlanes	finds addresses of and writes to bitplanes of the screen's bitmap.
AboutBmaps	A tutorial on creation and use of bmaps.
LoadILBM	loads and displays IFF ILBM pics.
LoadACBM	loads and displays ACBM pics.
ScreenPrint	creates a demo screen and dumps it to a graphic printer.
Disassem	Simple 68000 disassembler. Reads standard Amiga object files and disassembles the code sections. Data sections are dumped in hex. The actual disassember routines are set up to be callable from a user prog so instructions in memory can be disassembled dynamically. By Bill Rogers.
DvorakKeymap	Example of a keymap structure for the Dvorak keyboard layout. Untested but included because assembly examples are few and far between. By Robert Burns
Hypocycloids	Spirograph, from Feb. 84 Byte.
LinesDemo	Example of proportional gadgets to scroll a SuperBitMap.
MemExpansion	Schematics and directions for building your own homebrew 1 Mb memory expansion, by Michael Fellinger.
SafeMalloc	Program to debug 'malloc()' calls
ScienceDemos	Convert Julian to solar and sidereal time, stellar positions and radial velocity epoch calculations and Galilean satellite plotter. By David Eagle.

Fred Fish Disk 28

ABasic games by David Addison: Backgammon , Cribbage, Milestone, and Othello

Cpp	DECUS 'cpp' C preprocessor, & a modified 'cc' that knows about the 'cpp', for Manx C.
Shar	Unix-compatible shell archiver, for packing files for travel.
SuperBitMap	Example of using a ScrollLayer, syncing SuperBitMaps for printing, and creating dummy RastPorts.

Fred Fish Disk 29

AegisDraw Demo	Demo program without save and no docs.
Animator Demo	Player for the Aegis Animator files
Cc	Unix-like front-end for Manx C
Enough	Tests for existence of system resources, files, and devices
Rubik	Animated Rubik's cube program
StringLib	
Vt100	VT-100 terminal emulator with Kermit and Xmodem protocols

Fred Fish Disk 30

Several shareware programs. The authors request a donation if you find their program useful, so they can write more software.

BBS	an Amiga Basic BBS by Ewan Grantham
FineArt	Amiga art
FontEditor	edit fonts, by Tim Robinson
MenuEditor	Create menus, save them as C source, by David Pehrson
StarTerm3.0	Very nice telecom by J. Nangano

(Fred Fish Disk#30 is free if requested when ordered with at least three other disks from the collection.)

Fred Fish Disk 31

Life	Life game, uses blitter to do 19.8 generations a second.
Mandelbrot	Version 3.0 of Robert French's program.
MxExample	Mutual exclusion gadget example.
RamSpeed	Measure relative RAM speed, chip and fast.
Set	Replacement for the Manx "set" command for environment variables,with improvements.
Tree	Draws a recursive tree, green leafy type, not files.
TxEd	Crippled demo version of Microsmith's text editor, TxEd.
VDraw	Full-featured drawing program by Stephen Vermeulen.
Xicon	Invokes CLI scripts from icon
Ticon	Displays text files from an icon.

Fred Fish Disk 32

Address	Extended address book, AmigaBASIC
Calendar	Calendar/diary program, AmigaBASIC
DosPlus1	First volume of CLI oriented developer tools
DosPlus2	2nd volume of CLI oriented developer tools.

Executables only:

MacView	Views MacPaint pics in Amiga low or high res, no sample pictures, by Scott Evernden.
Puzzle	Simulation of puzzle with moving squares.
ShowHAM	View HAM pictures from CLI.
Solitaire	ABasiC games of Canfield and Klondike, from David Addison.
Spin3	Graphics demo of spinning cubes, double-buffered example.
Sword	Sword of Fallen Angel text adventure game written in Amiga Basic.
Trails	Leaves a trail behind mouse, in Modula-2

Fred Fish Disk 33

3dstars	3d version of the "stars" program below.
Bigmap	Low-level graphics example scrolls bitmap with ScrollVPort.
Dbuf.gels	Double-buffered animation example for BOBs and VSprites.
DiskMapper	Displays sector allocation of floppy disks.
MemView	View memory in real time, move with joystick.
Oing	Bouncing balls demo
Sproing	Oing, with sound effects.
ScreenDump	Dumps highest screen or window to the printer.
Sdb	Simple database program from a DECUS tape.
Stars	Star field demo, like Star Trek.
TermPlus	Terminal program with capture, library, function keys, Xmodem, CIS-B protocols.
Vt100	Version 2.0 of Dave Wecker's VT-100 emulator, with scripts & function

Fred Fish Disk 34

Alint	Support files for Gimpel's 'lint' syntax checker
Blink	PD 'alink' compatible linker,faster,better.
Browser	Updated to FF 18 'browser', in Manx, with scroll bars, bug fixes.
Btree	b-tree data structure examples
Btree2	Another version of 'btree'
Calendar	Appointment calendar with alarm.
Less	File viewer, searching, position by percent, line number.
NewFonts	Set of 28 new Amiga fonts from Bill Fischer
Pr	Background print utility, style options, wildcards.
Requester	Deluxe Paint-type file requester, with sample.

Fred Fish Disk 35

ASendPacket	C example of making asynchronous I/O calls to a DOS handler, written by C-A
ConsoleWindow	C example of getting the Intuition pointer a CON: or RAW: window, for 1.2, by C-A.
DirUtil	Walk the directory tree, do CLI operations from menus
DirUtil2	Another variant of Dirutil.
FileRequester	Lattice C file requester module, with demo driver, from Charlie Heath.
MacView	Views MacPaint pictures in Amiga low or high res, with sample pictures, by Scott Evernden.
Plop	Simple IFF reader program
PopCLI	Sidekick-style program invokes a new CLI, with automatic screen blanking.
QuickCopy	Devenport disk copiers duplicate copy-protected disks.
ScrollPf	Dual playfield example, from C-A, shows 400 x 300 x 2 bit plane playfield on a 320 x 200 x 2 plane deep playfield.
SendPacket	General purpose subroutine to send AmigaDos packets.
SpriteMaker	Sprite editor, can save work as C data structure. Shareware by Ray Larson.
Tracker	Converts any disk into files, for electronic transmission. Preserves entire file structure. Shareware by Brad Wilson.
TriClops 3-D	space invasion game, formerly commercial, now public domain. From Geodesic Publications.
Tsize	Print total size of all files in subdirectories.
Unifdef	C preprocessor to remove given #ifdef'd sections of a file, leaving the rest alone. By Dave Yost
Vttest	VT-100 emulation test program. Requires a Unix system.

Fred Fish Disk 36

Acp	Unix-like 'cp' copy program
Clock	Updated version of clock on disk 15.
Csh	Manx 'csh'-like CLI, history, variables, etc.
DietAid	Diet planning aid organizes recipes, calories
Echo	Improved 'echo' command with color, cursor addressing
FixHunk	Fixs programs to let them run in external memory.
Fm	Maps the sectors a file uses on the disk.
KickBench	Docs, program to make a single disk that works like a Kickstart and Workbench.
Lex	Computes Fog, Flesch, and Kincaid readability of text files.
TunnelVision	David Addison ABasic 3D maze perspective game.
Vc	Visicalc-like spreadsheet calculator program.
Vt100	Version 2.2 of Dave Wecker's telecom program
YaBoing	Oing! style game program shows sprite collision detects

Fred Fish Disk 37

This disk is a port of Timothy Budd's Little Smalltalk system, done by Bill Kinnersley at Washington State University.

Fred Fish Disk 38

CSquared	Sep 86 Sci American, Circle Squared algorithm
FixObj	Strips garbage off Xmodem transfered object files
Handler	AmigaDOS handler (device) example from C-A
Hp-10c	Mimics a HP-10C calculator, written in Modula-2
IFFEncode	Saves the screen as an IFF file
IffDump	Dumps info about an IFF file
Jsh	BDS C-like CLI shell
NewStat	STATUS-like program, shows priority, processes
Reversi	Game of Reversi, version 6.1
UUdecode	Translate binary files to text, Unix-like programs
Vdraw	Drawing program, version 1.14
VoiceFiler	DX MIDI synthesizer voice filer program
Window	Example of creating a DOS window on a custom screen

Fred Fish Disk 39

AnsiEcho	'echo', 'touch', 'list', 'cls' written in assembler.
Display	Displays HAM images from a ray-tracing program, with example pictures.
Driver	Example device driver source, acts like RAM: disk
Xlisp	XLisp 1.7, executable only

Fred Fish Disk 40

Ahost	Terminal emulator with Xmodem, Kermit and CIS B protocols, function keys, scripts, RLE graphics and conference mode.
AmigaMonitor	Dynamically displays the machine state, such as open files, active tasks, resources, device states, interrupts, libraries, ports, etc.
Arc	Popular file compression system, the standard for transitting files
AreaCode	Program that decodes area codes into state and locality.
Blink	'alink' replacement linker, version 6.5
Cosmo	An 'asteriods' clone.
Dg210	Data General D-210 Terminal emulator
DirUtil	Windowed DOS interface program, V 1.4
DOSHelper	Windowed AmigaDOS CLI help program
PagePrint	Prints text files with headers, page breaks, line numbers
PopCLI	Starts a new CLI with a single keystroke, from any program, With a screen-saver feature. Version 2, w/source.
SpriteEd	Sprite Editor edits two sprites at a time
X-Spell	Spelling checker allows edits to files

Fred Fish Disk 41

AmigaVenture	Create your own text adventure programs in AmigaBasic.
Csh	Version 2.03 of Dillon's C sh-like shell. Executable only
Dbug	Macro based C debugging packageupdate to FF #2
DualPlayField	example from CBM, update to Intuition manual
GetFile	Heath's file requester, with source
LatXref	Cross reference of Lattice 3.10 header files
Lines	Line drawing demo program
SetFont	Changes font used in a CLI window
Vt100	Version 2.3 of the VT-100 terminal program.

Fred Fish Disk 42

This disk contains an Amiga version of MicroGNUEmacs.

Fred Fish Disk 43

BasicBoing	AmigaBasic program demos page flipping of a 3D cube
Bbm	Demo copy of B.E.S.T. Business Management System.
BbsList	A list of Amiga Bulletin Board Systems
Cc	C compiler frontends for Manx and Lattice C
Copper	A hardware copper list disassembler
InstIFF	Converts Instruments demo sounds to IFF sampled sounds
PopColours	Adjust RGB colors of any screen
SpriteClock	Simple clock is displayed on a sprite above all screens
ST Emulator	Non-serious Atari ST emulator
WBrun	Lets Workbench programs be run from the CLI
Wild	Two Unix shell style wild card matching routines

Fred Fish Disk 44

Icons	Miscellaneous icons
NewIFF	New IFF material from CBM for sampled voice and music files
RayTracePics	The famous ray-tracing pictures, from FF#39, now converted to IFF HAM format for "much" faster viewing.
ViewILBM	Displays normal and HAM ILBM files

Fred Fish Disk 45

Clue	Clue board game
Make	Another 'make', with more features
Pictures	Miscellaneous pictures
Update	Updates older disk with newer files fromanother disk
WhereIs	Searches a disk for files of given name

Fred Fish Disk 46

Asm	Shareware 68010 macro assembler, ROM Kernal Manual compatible
CheckModem	'execute' file program detects presence of modem
Egad	Gadget editor from the Programmers Network
Jive	Transforms a file from English to Jive.
My.lib	A binary only copy of Matt's alternate runtime library. Author: Matt Dillon
ProffMacros	Subset Berkeley 'ms' and 'mm' macros for 'proff'
ValSpeak	Transforms a file from English to Valley Speak.

Fred Fish Disk 47

3D-Arm	Simulation of a robotic arm, very good graphics, teaching tool, including C source.
Juggler	Eric Graham's stunning HAM animation of a robot juggler
VT-100	Version 2.4 of Dave Wecker's terminal emulator, with Xmodem and Kermit file transfer protocols

Fred Fish Disk 48

Bru	Alpha version of a hard disk file archiver
Comm	Version 1.30 of a terminal emulator with phone directories
Csh	Version 2.04 of Matt Dillion's Unix 'csh'-like CLI replacement, including Lattice & Manx C source
Diskperf	Disk benchmark program for Unix and Amiga
Du	Computes disk storage of a file or directory
MemWatch	Program to watch for programs that trash low memory. It attempts to repair the damage, and puts up a requester to inform you of the damage. From the Software Distillery.
Profiler	A realtime execution profiler for Manx C programs. Includes C source.

Fred Fish Disk 49

Cycloids	Update of electronic spirograph from disk 27
DirUtil	Enhanced version of DirUtil from disk 35
MultiDef	Scans a set of object modules and libraries searching for multiply defined symbols
MyUpdate	Disk update utility with options for stripping comments from C header files, and interactive verification of the updating process
Plot	Computes and displays 3 dimensional functions in hires
Polygon	Moire type pattern generator with color cycling
QMouse	Queries whether a mouse button is pressed. This can give a return code that can customize a startup-sequence based on whether a mouse button was pressed.
Touch	Example of setting the datestamp on a file, using a technique from Commodore-Amiga
Trees	More extensive version of the trees program on Disk 31

Fred Fish Disk 50

Asm	Version 1.1 of a shareware 68000 macro assembler, compatible with the Metacomco assembler. This includes an example startup module and more Motorola mneumonics.
BreakOut	A brick breakout game, uses 3-D glasses
DiskZap	Version 1.1 of a program to edit disks and binary files
FirstSilicon	A smart CLI replacement with full editing and recall of previous commands
Missile	A Missile Command-type game, with sound, in assembler
PerfectSound	Sound editor for a low-cost sound digitizer
Sizzlers	Graphics demos
UnixArc	Ver of 'arc' for Unix System V machines,in C
Wombat	Version 3.01 of Dave Warker's terminal emulator

Fred Fish Disk 51

Bison	GNU for Unix 'yacc', working update to FF4
Compress	Update to the file compression program on Disk 6
Cos	"Wheel of Fortune"-type game in AmigaBasic
DifSsed	Unix-like 'dif' and 'ssed' for finding the differences between two files, and then recreating the other, given one file, and the list of differences.
Sq, Usq	Portable versions of the CP/M squeeze and unsqueeze

Fred Fish Disk 52

Assign	Replacement for AmigaDOS 'assign' command in C
Fractal	Makes random fractal terrains
Poly, HAMPoly	Workbench-type demos for making polygons in lores and HAM
MxGads	Example of mutual exclusion gadgets with GadgetText
Tek4010	Tektronix 4010 terminal emulator
VDraw	Versions 1.16 and 1.19 of a Deluxe Paint-like drawing program

Fred Fish Disk 53

Animations	Demo animations with player program for Aegis Animator
ARCre	Creates rename scripts for files with long names, so they can be easily 'arc'ed and un'arc'ed.
ARP	Preliminary AmigaDOS replacements for 'break', 'cd', 'chmod', 'echo', 'filenote' and ' makedir'
Compiler	Not fully ported to the Amiga, this is a 68000 C compiler. It wil produce simple assembly language output, but needs a lot of work.
Spreadsheet	Update with source of the 'vc' spreadsheet on disk 36
TarSplit	Port of program to split Unix 'tar'archives
UUencode	Utilities to encode and decode binary files for ASCII transmission, expanding them by 35%

Fred Fish Disk 54

Hanoi	Solves Towers of Hanoi Problem in it's own Workbench window. by Ali Ozer
ISpell	Port of a Unix screen oriented, interactive spelling checker. (Expansion RAM required) by Pace Willisson
Ing	A Screen of lots of bouncing little windows by Leo 'Bols Ewhac' Schwab
Lav	Displays number of tasks in run queue, averaged over last 1, 5, and 15 minute periods. by Willaim Rucklidge
MIDITools	Programs to play/record through the MIDI I/F. by Fred Cassirer
MoreRows	Program to make the Work Bench Screen larger than normal. by Neil Katin and Jim Mackraz
Tilt	Program to make your Amiga look like it didn't pass vibration testing. by Leo ' Bols Ewhac' Schwab

Fred Fish Disk 55

Csh	V2.05 of Matt Dillon's csh like shell (Modified for Manx C). by Matt Dillon, Modified by Steve Drew
NewStartups	New C Startup modules:
AStartup.asm	with 1.2 fixes and better quote handling.
TWStartup.asm	opens a stdio window, using user specs. by Commodore, posted to BIX by Carolyn Schepper
Palette	Change another program's screen colors. by Carolyn Schepper
PipeDevice	Allows the standard output of one process to be fed to the standard input of another. by Matt Dillon
ScreenSave	Save a normal or HAM mode screen as an IFF file. by Carolyn Schepper
ShanghaiDemo	Demo of the Activision game Shanghai.
SoundExample	A double buffered sound example for Manx C. by Jim Goodnow
Vsprites	A working vsprite example. by Eric Cotton
Vt100	V2.6 of Dave's Vt100 terminal emulator with kermit and xmodem. by Dave Wecker

Fred Fish Disk 56

ClipBoard	Clipboard device interface routines, to provide a standard interface. by Andy Finkle
ConPackets	Demos the use of DOS Packets, ConUnit, etc. by Carolyn Schepper
GetDisks	Program to find all available disk device names and return them as an exec list. by Philip Lindsay
GetVolume	Program to get volume name of the volume that a given file resides on. by Chuck McManis
Icon2C	Reads an icon file and writes out a fragment of C code with the icon data structures. by Carolyn Schepper
MergeMem	Program to merge the MemList entries of sequentially configured RAM boards. by Carolyn Schepper
mCAD	An object oriented drawing program, V1.1 by Tim Mooney

Fred Fish Disk 57

Replaced by FF97 Due to Copyright problems

Fred Fish Disk 58

ASDG-rrd	Extremely useful shareware recoverable ram disk. by Perry Kivolowitz
BigView	Displays any IFF picture, independent of the physical display size, using hardware scroll. by John Hodgson
EGraph	Reads pairs of x and y value from a list of files and draws a formatted graph. by Laurenece Turner
HyperBase	Shareware data management system. V1.5
MemClear	Walks through the free memory lists, zeroing free memory along the way. by John Hodgson
NewZAP	A third-generation multi-purpose file sector editing utility. V3.0 by John Hodgeson
RainBow	A Maurauder-Style rainbow generator. by John Hodgson
SMUSPlayers	Two SMUS plays, to play SMUS IFF music formatted files. by John Hodgson
View	A tiny ILBM viewer by John Hodgson
WBdump	JX-80 optimized workbench printer that does not use DumpRPort. by J. Hodgson

Fed Fish Disk 59

Browser	Update to browser program on disks 18 and 34. S-E
Browser2	Another different browser program. E
Clock	Clock program with fonts, colors. E
Dme	Dillon text editor V1.22 for programmers,ED
DropCloth	Puts pattern on Workbench backdrop,ED
DropShadow	Puts shadows on Workbench windows,E-D
FixWB	Similar to DropCloth, but doesn't work yet. S-D
mCAD	Object-oriented drawing program, version 1.2.2. Much improved over disk 56.
Robotroff	Demo of animated pointers on Workbench. S-E-D
Supermort	General compounding/amortization loan calculator. E-D

Fred Fish Disk 60

Various shareware and freeware programs

Blitz	Memory resident file viewer. Very fast. E-D
BlitzFonts	Makes text output faster. E-D
HandShake	Terminal emulator with VT52/VT100/ VT102support. E-D
Med	Mouse-driven text editor version 2.1. E-D
PrtDrvGen	Generates printer drivers, version 1.1.S available from author. E-D
Show	Slideshow-like IFF viewer, V2.1. E-D
Uedit	Customizable text editor V2.0. E-D
Ueturbo	Example Uedit setup macros. S-E-D

Fred Fish Disk 61

ATPatch	Patches Transformer to work under AmigaDOS 1.2. S-E-D
FillDisk	Writes zeroes to free blocks on a disk for security. S-E-D
LPatch	Patch for programs that abort when loading under AmigaDOS 1.2. S-E-D
MicroEmacs	Conroy MicroEmacs V3.8b, newer than disk 22. S-E-D
PearlFont	Like Topaz, but rounded edges.
Terrain	Generates fractal scenery. S-E-D
VSprites	Makes 28 Vsprites, from P&E Dok.

Fred Fish Disk 62

This is a port of the Unix game 'Hack', by the Software Distillery, version 1.0.3D.

Fred Fish Disk 63

This is a port of the Unix game 'Larn', by the Software Distillery, version 12.0B.

Fred Fish Disk 64

This is an offical IFF specification disk from Commodore, an update to disk 16.

Fred Fish Disk 65

Bawk	Unix text processor, like 'awk'. Doesn't work, but source is included. S-E-D.
MWB	Example of rerouting Workbench window open calls to another custom screen. Version 1.01, S-E-D
CloseWB	Example for closing a custom Workbench screen. S-E-D
Cookie	Generates one-line fortune-cookie aphorisms. S-E-D
JTime	Build-your-own mouse port clock.
MenuBuilder	Creates C source files for menus, based on text descriptions. S-E-D.
NewPackets	CBM tutorial on new packets and structures in AmigaDos 1.2.
PascalToC	Pascal to C translator, not so great. S-E-D
Prep	'rattor'-like FORTRAN preprocessor. S-E-D
RunBack	Starts programs from CLI, allowing CLI window to close. E-D

SunMouse	This program automatically clicks in windows when the mouse is moved over them. V1.0, E-D

Fred Fish Disk 66

AmScsi	Preliminary plans for a SCSI disk controller board.
Asm68k	Macro assembler, version 1.0.1. E-D
Assigned	Example for avoiding DOS insert-disk requester, by scanning the list of 'assign'ed names. S-E-D
Dk	Pretends to eat away at CLI window. S-E-D
Flip	Flips whole screen as a joke. S-E-D
Foogol	Foogol cross-compiler generates VAX assembly code. S-E-D
Free	Prints amount of free space on all drives.S-E-D
MallocTest	malloc/free memory test program. S-E-D
Melt	Pretends to melt the screen. S-E-D
Nart	Graphic flying string demo. S-E-D
Purty	Easy way to set printer attributes from Workbench. E-D
RayTracer	Simple ray tracing program. E-D
SendPackets	Updated CBM examples of packet routines on disk 35. S-E-D
SnapShot	Memory resident screen dump. E-D
TagBBS	Shareware BBS system, version 1.02.

Fred Fish Disk 67

AmCat	Shareware disk cataloging program.
AmigaSpell	Shareware Intuiton spelling checker, V2.0. E-D
Bouncer	3-D bouncing ball written in MultiForth, SED
Comm	Terminal program version 1.33, E
Dux5	Another version of DirUtil. S-E-D
HexCalc	Hex, octal, & decimal calculator. E-D
Icons	Various big and alternate image icons.
Mandala	Mandala graphics and sound. E
PersMait	Demo shareware personal file manager.
RSLClock	Menu bar clock version 1.3. E-D
RTCubes	Graphics demo of 3D cubes. E-D
Wheel	"Wheel of Fortune"-type game,AmigaBASIC

Fred Fish Disk 68

This is version MG 1b of the MicroGNUEmacs. Source and executable areincluded, as well as source for other computers besides the Amiga.

Fred Fish Disk 69

Asm68k	Macro assembler, v1.0.3, E-D
BlitLab	Blitter exploring program, in C, S-E-D
Conman	Replacement console device handler adds editing and history to any application that uses CON:, v0.9, E-D
Console	Replacement console routines, in C, S-E-D
Dk	Decays the screen bit by bit, update to disk 66, in Modula-2, S-E-D
Frags	Displays memory fragmentationby listing the size of free memory blocks, in C, S-E-D
IconType	Change the type of an icon, in C, S-E-D
Make	'make' in Manx C, S-E-D
MonProc	Monitors processes for packet activity, in C,S-ED
MouseClock	Mouse pointer into a digital clock,in C,SED
Sb	Browses system structures, from Transactor magazine, v1.0, in C, S-E-D
Spew	Generates 'National Enquirer'-type headlines from rules file. In C,S-E-D
Spool	Three programs to demonstrate multitasking & spooling in a printer spooler. In C, v1.2, S-E-D
Wc	Counts words ala Unix 'wc', but faster, in C,S-ED

Fred Fish Disk 70

This is a disk of shareware programs.

AmigaMonitor	Explores state of the system, v1.13
Arc	Standard file compressor andl librarian, v0.23, a port of MS-DOS v5.0. E-D
BlackBook	Phone book program.
DoTil	Intuition-driven file manipulator program,v2.0.
GravityWars	Game of planets, ships and black holes,v1.03.
Jobs	Alternate user interface to CLI and WB, v2.1.
Lens	Magnifies area around mouse, shows it in a window, v1.0.
Life-3d	3D version of the classic cellular-automaton game, v1.2.
Logo	Logo language interpreter
SetKey	Demo keymap editor, v1.0
Vpg	Makes displays for aligning video monitors, v1.0.

Fred Fish Disk 71

AirFoil	Makes airfoils using the Joukowski transformation, in C, S-E-D
Amiga Basic	Miscellaneous programs including 3D plot program, a kaleidoscope, C-A logo drawing program file comparison utility string search program, S-E-D
Blocks	A variation of "lines", but with variable color blocks. E-D
Comm	Great terminal program, v1.34, E-D
DiskX	Utility for exploring file system.E-D
Fpic	Simple image processing program that operates on IFF pictures, with several filters, merging images, E-D
IconMk	Makes icons for files , v1.2a, E-D
Icons	New icons
NewFonts	Two new fonts; 'shalt18', an electronic ciruit element font, and 'ibm5', a PC-like font.
PetCLI	An AmigaBASIC CLI shell program.
PWDemo	Demo of the commercial product PowerWindows,v1.2. It aids creation of custom windows, menus, and gadgets, giving C or assembly source. E-D
Rot	Creates and animates 3-D objects, v0.5, E,D
TimeSet	Sets time from Workbench, E-D

Fred Fish Disk 72

This is a disk of IFF pictures.

Fred Fish Disk 73

Add	Customizes existing program menus with Amiga-key shortcuts. Also includes 'until', which waits until a given window is created. Shareware, in C, S-E-D.
AutoIconOpen	Fools WB into thinking mouse has double-clicked icons. In C, S-E-D
Dio	Generic Exec device interface code for opening libraries, getting multiple I/O channels, asynchronous operations, etc. In C, S-E-D.
Dissolve	Slowly displays IFF files, ala Nov 86 Dr. Dobb's program. In C, S-E-D
DTerm	Flexible, reprogrammable terminal program v1.10, E-D
Expose	Re-arranges windows so that at least one pixel of menu bar gadgets are exposed. InC, S-E-D.
Lit	Scans a text file, converts to C-style printable strings.C,v2.0, S-E-D
Lmv	"Long Movie", program views series of IFF picts in quick succession, upto 19 fps. Shareware, E-D
MouseOff	Mouse pointer disappears after ten seconds of non-use. In C, S-E-D
ParOut	Examples of controlling parallel port with resources instead of the PAR: device.In C,S-E-D
PenPalFont	Child-like font.
RunBackGround	Similar to RunBack on disk 66, runs program from the CLI allowing the CLI window to close. In C,S-E-D
SnapShot	Screendump utility,update FF 66.E-D
TypeAndTell	Example installs a device handler before Intuition, and speaks each key as it is pressed. In C and assembler, S-E-D
Xplor	Prints info about system lists, in assembler,S-E-D

Fred Fish Disk 74

Cled	Edits and recalls CLI commands, v1.3, E-D
Control	Intercepts graphic printer dump calls and accesses color map, width,and screen resolution. C,S-E-D
Dme	Simple WYSIWYG text editor for programmers,v1.25. Update of FF 59.E-D
DropShadow	WB dropshadows, v2.0.UpdateFF59. E-D
Funds	AmigaBASIC prog tracks mutual or stocks-D
Less	Text viewing program, like Unix "more", v1.1, update to disk 34. S-E-D
Makemake	Scans C source files and constructs a vanilla 'makefile' in the current directory. S-E-D
mCAD	Object-oriented drawing prog. v1.2.4, update to FF 59.Shareware, E-D
Random	Simple random number generator in C. S-E-D
TDebug	Monitors devices by intercepting Exec SendIO() and DoIO() vectors, in C, v1.0, S-E-D
Units	Converts measurements in different units, includes "chart" option, in C, S-E-D
XCopy	Replacement for AmigaDOS 'copy', doesn't change the date, uses Unix wildcards. E-D

Fred Fish Disk 75

Bezier	Play with Bezier curves points and granularity, S-E-D
BSplines	Play with b-splines, as above, S-E-D
Comm	C source for Comm terminal program v1.34. S-E-D
Copy	Replacement 'copy' command v1.0, preserves date, in C, S-E-D
Diff	Simple 'diff' in C, S-E-D
DuM2	Another DirUtil in Modula-2, v1.5, S-E-D
Eless	Fast 'dir' program in C, S-E-D
Fd	Faster 'eless' in C, S-E-D
HardCopy	Sends a transcript of a CLI session to a file, in C, S-E-D
MouseOff	Update FF73, turns off mouse pointer, S-E-D
SetFont	Changes the font in a Workbench screen, v2.0, S-E-D
SpeedDir	Another fast 'dir', in assembler, S-E-D

Fred Fish Disk 76 & 77

These are disks 1 and 2 of Chris Gray's Draco distribution for the Amiga. Draco is a compiled, structured language reminiscent of both C and Pascal. A full interface to AmigaDOS and Intuition is supplied. Be sure to get both disk 76 and 77.

Fred Fish Disk 78

Cycles	Cycle game like "Tron", v1.0, E-D
EOMS	Experts Only Mercenary Simulator game, E-D
MandelVroom	Mandelbrot generator with enhanced palette controls, fixed/floating point, presets, v1.50, in Manx C, S-E-D

Fred Fish Disk 79

AsmTools	CLI tools in assembler: echo, loadit, mounted, setlace, why; S-E-D
AssignDev	Give devices multiple names, in C, S-E-D
AuxHandler	Example of a dos handler that allows use of a CLI via the serial port. Includes source. Author: Steve Drew
Cmd	Redirects printer output to a file, in C, S-E-D
Info	AmigaDOS 'info' replacement, in C and assembler, S-E-D
Kill	Removes a task and its resources, in C,S-E-D
M2Error	Displays errors from TDI Modula-2 compiles, S-E-D
MonProc	Update to process packet prog. from FF69,in C,S,E,D
Mounted	Program for testing if a drive is present, in a script In C, S-E-D
Nro	Another 'roff'-style text formatter, in C, S-E-D
ParTask	Finds parent task, in C, S-E-D
QueryAny	For scripts, asks a question, accepts Y/N, gives return code. In assembler, S-E-D
ScrSizer	Resets pref settings for screen size, in C,SED
SharedLib	Example, shared lib, in C & assembler, S-E-D
Task	Simple CreateTask() example in C, S-E-D
Uw	Unix Windows client v1.0, in C, S-E-D
Who	Lists tasks on ready and wait queues, in C, S-E-D

Fred Fish Disk 80 (see Fred Fish 90)

Fred Fish 80 has been withdrawn due to copyright problems.

Fred Fish Disk 81

Asm68k	V1.1.0 of a macro assembler
AutoFacc	Shrinks the FACC window and moves it to the back
Brushes	53 custom IFF brushes of electronic symbols
CheckIFF	Checks structure of an IFF file CledV1.4 update FF74 of a simple CLI
Conman	Replaces console handler to add editing and history to many programs
Fonts	Miscellaneous fonts
Icon	V6.0 of the Icon programming language
KeyLock	Freezes the keyboard and mouse until pass word entered.
ScatDisplay	hack created from "lng"
Smush	Smushes an IFF file.
Target	Each mouse clikc becomes a gunshot

Fred Fish Disk 82

Adventure	Port of the classic Crowther and Woods game
AmicTerm	V0.50 of a telecommunications program, with scripts, redial, beeps, enhanced file requester
D2D-Demo	Demo version of Disk-2-Disk by Central Coast Software
DX-Synth	Voice filer program for Yamaha DX series synthesizers, update to disk 38
DiskMan	V1.0 of another DirUtil program
Icons	Miscellaneous new icons
Panl	Universal MIDI patch panel, v1.2
Rocket	Another Workbench hack, plays Lunar Lander
Sand	Game of sands following your pointer.

Fred Fish Disk 83

This disk contains a demo version of TeX from N Squared. It is limited to small files, and the previewer can only display ten pages or less, and only a small number of fonts are provided.

Fred Fish Disk 84

AudioTools	Programs from Rob Peck's July/August Amiga World article
BlitLab	Blitter experimentation program, V1.2, update to FF69
Ed	Simple editor, similar to Unix 'ed', based on the editor in Software Tools.
GravityWars	Game of planets, ships and black holes, v1.04, update to disk 70.
HunkPad	Adds legal padding to executables for Xmodem transmission.
PipeHandler	An AmigaDOS pipe device which supports named pipes and taps. V1.2
PopCLI	V3.0 of a hot-key to invoke a CLI window, with screen blanker, update to disk 40.
Requester	Update FF34, file requester similar to DPaint.
ScottDevice	V33.1 of a 'mount'able MicroForge SCSI driver.
Viacom	Another Schwab hack, makes TV-like static on screen.Parody

Fred Fish Disk 85

Csh	V2.06 of Dillon's 'csh'-like shell
FileReq	Source to widcard file requester
Hide	Hides expansion memory from programs
ImageTools	Shareware tools to manipulation IFF images
LowMem	ServerShared library to aid in low memory situations
Plot6	A star plotting program with source.
RawIO	Example of setting raw mode on standard input
Rocket	Lunary Lander for Workbench, with source.
VMore	"more"-like text viewing utility, v1.0 SE
Vnews	Simple Unix news reader.

Fred Fish Disk 86

AutoPoint	Auto-selects window under the mouse pointer, with screensaver.
ClickToFront	Double-clicks in window brings it to front, v1.1, S-E-D
Cmd	V3.0 of a tool to redirect printer output toa file.
FileIISG-Demo	Demo of Softwood File IIsg, a database manager with sound and graphics.

Fred Fish Disk 87

AdvSys	Adventure system from Byte May 1987, v1.2 E-D
AutoIconOpen	Fools Workbench to open disk icons, V1.2 update to disk 73, S-E-D
Claz	Converts IFF files to PostScript, V2.0, SED
Commodi	tiesMackraz's Commodities Exchange, an exec library to manage input handler, v0.4
Diff	Update to disk 75 of Unix-like 'diff', S-E-D
Dme	V1.27 of Dillon's text editor, update FF74,E-D
DropShadow	V2.0 of prog. that puts shadows on Workbench, S-E-D
Elib	Shared library example in Manx C.
ID-Handler	An AmigaDOS device handler generates unique identifiers, V1.0, S-E-D
Install	Alternate AmigaDOS 'install' programs,SED
MemWatch	Waits for low memory trashing, V2.0, SED
MovePointer	Moves pointer to given location, S-E-D
MoveWindow	Move window to given location, S-E-D
MunchingSq	Munching Squares hack, S-E-D
PalTest	Test to see if this is a PAL machine, S-E-D
Sc	Generates random scenery, S-E-D
Tek4695	Tek4695 printer driver
WBDualPF	Example of dual-playfield screen, update FF41, S-E-D
WarpText	Fast text rendering routines, S-E-D
Yaiff	rExample IFF reader, S-E-D
Zoo	A file archiver like "arc", v1.42A, E-D

Fred Fish Disk 88 (see Fred Fish 89)

FF Disk 88 has been removed due to copyright problems

Fred Fish Disk 89 (replaces Fred Fish 80)

DirMaster	Disk catalogue program, V1.0a, E-D
FuncKey	Shareware function key editor, V1.01, E-D
MFF-Demo	Demo of MicroFiche Filer database prog
ScreenShift	Adjust screen position ie Preferences,SED
Snake	Bouncing squiggly lines demo, S-E-D
AutoEnguirer	screen contraption requester improvement S-E-D
DemoLition	Display Hack S-E-D

Fred Fish Disk 90 (replaces Fred Fish 80)

AmiGazer	Night sky viewer of 1573 stars, set date, time, day. E-D
CardFile	AmigaBasic card file study aid. E-D
Conman	Console handler replacement gives line editing and history to most progs, v0.98,ED
IMandelVroom	Slight update to disk 78 Mandelbrot program, E-D
NewDemos	Replacements for lines and boxes demos that take less CPU time, E-D
Othello	Game of Othello, E-D
PrinText	Displays text files with gadgets, speech, IFF display, v1.2, E-D
PrDrvGen	Automatic printer driv. generator,v2.2b,ED
RainBench	Cycles colors of WB backdrop or text. ED
ShortCut	Makes single-key shortcuts for entering commonly typed CLI commands,&custom macros. E-D
ShowPrint	Displays and prints all sizes of IFF pictures & controls printer output styles, v2.0 E-D
Sizzlers	Graphics demos, v1.7.0, E-D
Timer	Small Workbench timer counts time and $/ minute, E-D
Tools	Inovatronics tools: a memory editor, memory disassembler, ASCII chart, and calculator. E

Fred Fish Disk 91

Adventure Definition Language (ADL) a superset of an older language called DDL by Michael Urban, Chris Kostanick, Michael Stein, Bruce Adler, and Warren Usui. ADL enhancements by Ross Cunniff. Included are sources to the ADL compiler, interpreter, and debugger. Binaries combined by Ross with Lattice 3.03. CLI enviornment only. Documentation is available from the authors.

Fred Fish Disk 92

As6502	portable 6502 assembler, C source, by J. Van Ornum, Amiga port by Joel Swank
Bawk	Text processor update from FF65 Inspired by UNIX awk. Searches files for patterns, performs actions based on patterns. By Bob Brodt; Amiga port by Johan Widen
HunkPad	update of FF84 version. by J. Hamilton,pads an object file to a multiple of 128 bytes for better xmodem transfer. S E
Less	Like Unix "more", better, version 1.2 update of FF74. Scrolls Back and forward. S E by Mark Nudelman, Amiga port by Bob Leivian.
Ndir	Library that implements the 4BSD unix dir access routines by MikeMeyer. S
Parse	Recursive descent expression parcer, computes, and prints expressions. includes transcendental function support. c Source included. by J Olsen
Shar	Two programs to pack and unpack shell archives includes C source. by Fabbian G. Dufoe
SmallLib	8 times smaller Amiga.lib replacement, binary only. by Bryce Nesbitt
UUencode	Encode/decode binary files for e mail or text-only methods. Update of FF53, includes checksum technique, compatible with older versions, plus transparent to older versions options. By Mark Horton, modified by Alan Rosenthal and Bryce Nesbitt.

Fred Fish Disk 93

Dme	Version 1.27 WYSIWYG programmer editor. Not a word processor. Includes key mapping, fast scrolling, title-line statistics, multiple windows, ability to iconify windows. Update of FF87, includes source code. by Matt Dillon
MicroEmacs	Version 3.8i, update to FF61 includes source. Orig by Dave Conroy multiple modifications by Daniel Lawrence

Fred Fish Disk 94

AudioTools	Demo programs from Rob Peck's July/Augustt issue of AmigaWorld on accessing the audio device. V2,update of FF84. S. by Rob Peck
ClickUpFront	Similar in function to ClickToFront prog (FF86), bring windows tofront by clicking on any part of them. V 1.0. by Davide Cervone SE
HeliosMouse	Automatically activate a window simply by moving the mouse pointer into the window. V 1.0. Includes source. By Davide Cervone
IFF2Ps	Convert any IFF file to postscript for printing or viewing on a postscript compatible device. Version 1.2, by William Mason and Sam Paolucci E
ModulaTools	Various Modula 2 programming routines. by Jerry Mack
Terrain3d	Pseudo-random 3d relief scenery generator, update of "sc", FF87. by Chris Gray, 3d by Howard Hull

Fred Fish Disk 95

Cmd	redirects the serial.device or parallel. device output to a file. Capture print jobs, debug or "offline" printing.V4 By C Schepponer SE
CygnusEdDemo	Demo of CygnusSoft's CygnusEd editor, a multiplefile, multiple feature editor.Includes demo 3.0 of MandFXP. by CygnusSoft Software E
Gomf	"Get Outa My Face" makes the Guru go away to allow clean-up & shutdown more cleanly. V 1.0, by Christian Johnsen E
Journal	records sequence of mouse & keyboard events, stored in a file for future playback. Good for demos or documenting bugs. E. by D. Cervone
MergeMem	attempts merging of MemList entries of sequentally configured ram boards. When successful, allows allocating a section of memory which spans both boards. V 2, update of FF56. by Carolyn Scheppner SE
PrinterStealer	Asimilar to "Cmd", allows diversion of output destined for printer to a file. Binary only, Source avai. from authors. by A. Livshits & J-M Forgeas
Record-Replay	similar to "Journal", records and plays back mouse and keyboard events. B only. source avail. from authors, Alex Livshits & J-M Forgeas

Fred Fish Disk 96

AnimPlayer	Animation reader and displayer by the combined efforts of Videoscape, Sculpt3D, Silver, Forms- In-Flight, and Animator:Appreticeby M Hashetal.
Chess	Amiga port, non-Amiga interface. High playability. V 1.0, S. by J. Stanback, Amiga port by B. Leivian
Hackbench	provides source for WB-Likeprog, for experimentation & validation of new interface ideas. Not a WB replacement. by Bill Kinnersley
Label	Print labels with arbitray text. V 1.3, Source available from author, M.Hansen
LineDrawer	Produces line drawings based on drawing commands stored in a text file. Includes demo that draws an outline map of the USA and state borders. V1.0, SE. by John Olsen
PopUpMenu	Example code implementing pop-up menus, reasonably compatible with Intuition menus.SE. by Derek Zahn
Tek4695	Tektronix 4695/4696 printer driver. SE. by P Staub
TimeRam	Fast and Chip ram test prog,E by B Takahashi
WarpText	Fast text rendering routines, to be linked with application progs.Text display "as fast or faster than 'blitz'". V2.0 update of FF87, S by Bill Kelly

Fred Fish Disk 97

Replaces FF57 for Copywrite problems

CutAndPaste	Implementations of Unix cut and paste commands. by John Weald

For PDS orders, please use form on page 127

GraphIt	Progran to plot simple functons in 2 or 3 dimensions. by Flynn Fishman
Juggler	V1.2 of robot juggler animation. Uses HAM mode and ray tracing. by Eric Graham
MouseReader	Shareware program to read text files & view IFF files using only the mouse. by William Betz
Splines	Prog to demonstrate curve fitting & ren-dering techniques. by Helene (Lee) Taran
Shm	Simple graphics demo, approximately simulates the motion of two interacting pendulums. Includes Source by Chris Ediss

Fred Fish Disk 98

Access	16 color terminal program based on Comm V1.,34. Includes Macro window, custom gadgets, colorized menus, etc. V. Beta 0.18 by Keith Young ,comm by D.J.James. E.
Backup	Writes AmigaDos disks as the backup destin-ation. recover files from the backup disk. Requires manual decisions on disk structure. by Alan Kent SE
DCDemo	DishCat 2.3, a disk catalog program, demo limited to cataloging 100 files at a time. by Ed Alford, MicroAce Software
HdDriver	WD-1002-05 hard disk controller driver. Card capable of maintaining 3 hard disks and 4 floppies, the driver is capable of only one hard disk. by Alan Kent SED
QBase	Quick-Base, a "MailBase Management utility", define and maintain a maximum of 200 records per file. by Kevin Harrise E
Thai	Thai language quiz program. Speak or type english/Thai sentences from supplied file. by Alan Kent SE

Fred Fish Disk 99

A-Render	Version .3 a Ray-Tracing Construction Set for the Amiga Computer by Brian Reed ED

Fred Fish Disk 100

Berserk	Must see animation, by Leo Schwab
Conman	Console handler replacement, provides line editing and command line histories transparent to application prog uses CON: windows. Shareware V1.0 by W Hawes. E.
WBLander	Workbench display hack game, upgrade of "Rocket" on FF85, now with sound effects. By Peter da Silva. E

Fred Fish Disk 101

CirPlane	Circular plane generator for VideoScape3D. Generates a clockwise circular polygon with the specified number of vertibles. V1.0 by T Floryan SE
IconAssembler	Change Workbench Icons with IFF-brush files by Stefan Lindahl E
Microspell	Standalone spelling checker scans text files and reports errors. 1000 common word list, 43,000 word main dictionary with multiple user dictionary support. Interfaces with MicroEMACS 3.9 with an emacs macro to step through the source file, stopping at suspect words and allowing the user to option. V1.0 by Daniel Lawrence, SED
Midi	midi library and utility set. Includes Midi monitor, routing utility, status utility, and more. by Bill Barton SED
PsIntrp	Postscript Interpreter reads and previews files on screen. by Greg Lee S(assy)E
StartUps	Three C startup file replacements for standard Astartup.obj and LStarup.obj. Options include (1) BothStartup.obj, for the WorkBench programs or CLI programs with or without command line parameters. (2) WBStartup.obj, for WorkBench programs or CLI programs that require no command line parameters. (3) CLIStartup.obj for CLI programs that require command line parameters but do not need to be WorkBench runnable. by Bryce Nesbitt SE

Fred Fish Disk 102

Doug	Machine independent macro based C de-bugging package. Update FF41. by F Fish profiling support by Binayak Banerjee SE
Match-stuff	Heavy duty text pattern matching stuff. includes simple match text replacement capability. By Pete Goodeve
Sectorama	Recover lost or damaged data from floppy or hard disks or repair a damaged volume. by David Joiner E
SliCon	Smart input line interpreter with window for full editing. Upgrade FF50 by P Goodeve., E
Xicon	Use icons to call up scripts containing CLI commands. V2.0 upgrade of FF31.by Pete Goodeve E

Fred Fish Disk 103

AvlTrees	Library and test prog. implement routines for creating and using trees held in memory.S.
Calc	A programmable RPN calculator.
Cref	A C cross ref. prog. S.
DosKwik	A pair of progs. allows you to save files to one or more floppies for quick loading. Doesn't store Dos format.
IntuiDos	A prog. to improve control and handling of the material on all disks in 'CLI-area'.
MFF-Update	A text import util. for MicroFiche Filer (demo on FF 89) and updates to some PD disk library databases.
Pack-It	Takes all files the files and dirs. on a disk & packs them into a single file. for modem.
Sol	Amiga version of solitaire.

Fred Fish Disk 104

Analyticalc	Is a large and powerful spreadsheet prog.

Fred Fish Disk 105

AsmProgs	Misc. assembly tools. Includes some S.
BasicProgs	LeastSquare solves least square probs & graphs results. S.
Bison	A replacement for unix "yacc" command. S.
Dmouse	Another prog in the traditon of display hacks". S.
FlamKey	Allows keyboard and mouse inputs to be locked until a password is entered.
GravityWars	Game of planets,ships and black holes, v2.0 update to FF84.
IPo2C	A util. to write a C-lang definition to mimic the intuition pointer.S
Pere-et-Fil	Ex. of creating & using reentrant processes. S.
Record Replay	Similiar to "Journal" v2.0 update to FF95.

Fred Fish Disk 106

Funckey	Shareware function key editor, v1.1update to FF89. Source avail. from author(Anson Mah).
MoreArt	A small selection of some Amiga artwork.
QuickFlix	An IFF slideshow and cel animation prog,v0.13.
RistiNolla	A Finnish game. Also called Go-Moku. v1.0

Fred Fish Disk 107

Csh	V2.07 of Matt Dillon's csh like shell.S.
Diff	A util.,similiar to other common "diff" programs.S.
ProSuite	Suite provides ex. code of facilities such as FileIO Requester, XText, DoRequest & tutorial on how to program the Amiga. Book 1.01.S
SVTools	Some useful tools. S.

Fred Fish Disk 108

AList	Dir listing prog. based on LD4 prg S
DirMaster	Disk cataloger. v1.0b, update to FF89. S.
Dots-Perfect	Printer Driver for an Epson MX80 printer with upgrade kit installed. S.
MonIDCMP	Lets you monitor the IntuiMessages that pass through an IDCMP window. Prints the message class,mouse coordinates,qualifier values. Great for debugging. S.
PrintPop	A util. to send common control settings to PRT: device. S.
Sectorama	Utilities to recover lost or damaged data from floppies & hard disks. v1.1, an update toFF102.
Tek	Vt100 emulator for a Tektronix 4010/4014. (V2.6) update to FF52. S.
Zoo	File archiver, like "arc". v1.24B. update to FF87

Fred Fish Disk 109

Machine	A new animation.
SimCPM	A CP/M sim,simulates 8080 along with h19 emulation. S.
UUpc	Hook up your Amiga as a usenet node. S.

Fred Fish Disk 110

A68k	A 68000 assembler written in C. S.
Pdc	An optimizing C compiler for the 68000 processor. update to FF53. but not based on the code of that disk.

Fred Fish Disk 111

AmyLoad	A graphical monitor of cpu, blitter, & memory use. Includes two components; load.device,monitors system parameters, & amyload, which is the user interface & display program. by Jeff Kelley SE
AssignDev	Assigns multiple names to a given device. modified version of the original released on disk number 79. By Phillip Lindsay, mod by Olaf Seibert SE
Gauge	Continuously displays memory usage in a vertical bar graph Binary only. By:Peter da Silva
HeliosMouse	Another "sunmouse"prog. Automatically activates a window by mouse pointer V 1.1, update to disk 94. By:Davide Cervone SE
Labels	Alphabetic & numeric ordered cross reference lists of defined system constants. Recommended for debugging purposes only, use the symbolic values in progs! By:Olaf Seibert
Mandel	Another mandelbrot generator program, with bits & pieces of code from C. Heath & R.J. Mical. By:Olaf Seibert S
PopLife	A PopCLI type that plays life all over your screen. Lots of bits & pieces from Tomas Rokicki's blitlab & John Toebes' PopCLI. By:Olaf Seibert S

Fred Fish Disk 112

BeachBirds	Beach scene portrayed by sprites & sound 512K machine. By:Jerrold Tunnell B only.
Bully	Pushes all open screens around (thus the name "bully"). Show more than one demo at a time By:Mike Meyer S
DropShadow	Dropshadow V2.0, use with Bryce Nesbitt's Wavebench demo. B only. By:Jim Mackraz
HagenDemos	"RGB" & "Focus". RGB requires one meg, B only. By:Joel Hagen
Viacom	Latest version of viacom for use in conjuction with WaveBench demo. B only. By:Leo Schwab & Bryce Nesbitt
WaveBench	A neat screen hack, & runs on 512K machines. For more laughs, try in conjunction with Viacom or Ds (Dropshadow). Includes S. By:Bryce Nesbitt

Fred Fish Disk 113

AmiCron	Simple Unix "cron" type program,a background task uses a disk-resident table to automatically run certain tasks on a regular basis, at specific times. V 2.3, includes S. By:Steve Sampson, Amiga port by Rick Schaeffer
Dme	V 1.28f of Matt's text editor. A simple WYSIWYG editor designed for programmers. It is not a WYSIWYG word processor Features include arbitrary key mapping, fast scrolling, title-line statistics multiple windows, & ability to iconify windows. Update to FF93, includes S. By:Matt Dillon
DosDev	Example DOS device driver in Manx C. Version 1.10, includes S. By:Matt Dillon
M2Amiga	Demo of the final product M2Amiga. A fast single pass Modula-2 compiler with editor, linker, a small set of interface & standard libraries. Compiles only small demo programs by limiting codesize & imports. Further development of the ETHZ compiler on Disk 24. B only. Demos with Source. By:R. Degen, C. Nieder, M. Schaub, J. Straube (AMSoft)
NoIconPos	Clears position info of any icons, allows WorkBench to pick a new place for the icon. Useful for disk & drawer icons where Snapshot rewrites the icon & the window information. Modula-2, another demo for M2Amiga By:Markus. Schaub

Fred Fish Disk 114

CDecl	English to C (and vice versa) translator for C declarations, a must for anyone except possibly the most hardcore C guru. By:Graham Ross, S
Vt100	V2.7 of vt100 terminal emulator with kermit & xmodem file transfer. Includes a few bug fixes posted to Usenet shortly after the posting of v2.7. Update to FF55. Includes S. By:Dave Wecker
WBLander	a special version of the WBLander program from FF100. Ending is unique. Effective use of sound, Includes S. By:Peter da Silva & Karl Lehenbauer

Fred Fish Disk 115

Killer	Masterful Video commercial of the Amiga, Beatles music, requires one meg of memory to run. Binary only. By:R. Wilt
Marketroid	Another devious sprite oriented demo with lots of "in" jokes. 512K required, includes S. By:Leo Schwab

Fred Fish Disk 116

Movies	A ram animation system with three different example animations; Kahnankas, Rocker, & F-15. Kahnankas & Rocker run on a 512K Amiga & show off overscan HAM mode. Includes a animation player program (movie), animation builder programs (dilbm, pilbm), & a text/graphics display program (vilbm). By:Eric Graham & Ken Offer

Fred Fish Disk 117

AMUC_Demo	A really neat horizontal scrolling demo that is a 2400 x 200 pixel 32 color IFF picture composed of digiview snapshots of members of the AMiga Users of Calgary, superimposed on a very wide picture of the Calgary Skyline. B only. By:Stephen Vermeulen & Stephen Jeans
ExP_Demo	Demo version of Express Paint 1.1., used to create the scrolling demo picture in the AMUC_Demo drawer on thi disk. B only. By:Stephen Vermeulen

Fred Fish Disk 118

Empire	This is a complete rewrite, from the ground up, in Draco, of Peter Langston's Empire game. A multiplayer game of exploration, economics, war, etc, can last months.Played either by local keyboard or through modem.V1.0, shareware, & includes S code. By:Chris Gray, original game by Peter Langston
HAMmmm	Displays lines whose end points are bouncing around the screen, which is a double buffered HAM screen. The Y positions of the points are continuously copied into an audio waveform that is played on all four channels, & the pitch of a just intoned chord is derived from the average X position of these points. JForth. Source By:Phil Burk
Stars	Based on original code by Leo Schwab, has credits longer than the actual demo. Runs on 512K Amiga. B only. By:Hobie Orris
WireDemo	Demonstrates the Amiga's line drawing speed. Runs on a 512K Amiga. Includes S. By:Matt Dillon

Fred Fish Disk 119

MicroEMACS	Version 3.9e of Daniel Lawrence's variant of Dave Conroy's microemacs. This is an update to the version released on disk 93. Also included, for the first time, is extensive documentation in machine readable form. Includes source. Author: Dave Conroy, MANY enhancements by Daniel Lawrence

Fred Fish Disk 120

Amoeba	This clone of Space Invaders is one of the best freely redistributable games for the Amiga to date. Unlike many commercial games, it even works correctly in a multitasking environment (by not requiring you to reboot just to play a game). Highly recommended! Binary only. Author: LateNight Developments
BackGammon	A graphical Backgammon game done as an undergraduate A.I. course project. Version 1.0, includes source. Author: Robert Pfister
Bankn	A complete checkbook system offered by the author as shareware. Version 1.3, binary only. Author: Hal Carter
EgyptianRun	Cute little "road race + hazards" type game. Version 1.1, binary only, shareware, source available from author. Author: Chris Hames
IconImage	Program to replace an old icon image with a new image, without affecting icontype, drawer data, etc. Includes source. Author: Denis Green

Fred Fish Disk 121

BasicStrip	An AmigaBASIC program that helps to convert programs written in other forms of Basic to AmigaBASIC. Author: George Trepal
DataPlot	A shareware plotting program written in AmigaBASIC. Also includes a least squares curve fit program. Author: Dale Holt
Plot	A shareware 3-D graphing program written in AmigaBASIC, with some sample output plots. Source available from author. Author: George Trepal
Stairs	This AmigaBASIC program demonstrates a musical illusion based upon perceptual circularity of widely spaced tones whose volumes are defined as a sinusoidal relationship to their frequency. Author: Gary Cuba
Uedit	Version 2.3 of this nice shareware editor. Has learn mode, a command language, menu customization, and other user configurability and customizability features. Binary only, shareware, update to version on disk 60. Author: Rick Stiles
WBColors	A simple little program to change the Workbench colors to a predetermined color set, for programs that expect to be booted off their distribution disk but instead are run from a hard disk. Includes source. Author: Stefan Lindahl

Fred Fish Disk 122

Asteriods	Nicely done "blast the asteriods" type game. Unique feature is that all the images and sounds are replaceable by the end user. So instead of ships and rocks, you can have an Amiga against a horde of IBMPC's if you wish. Author: Rico Mariani
Iff2Pcs	An interactive puzzle program that takes any IFF file containing up to 16 colors, and breaks it up into squares to make a puzzle which the user can then piece back together again. Version 1.0, includes source. Author: Ali Ozer
Names	A shareware program to create and manage mailing lists. Binary only. Author: Ernie Nelson
Pr	A little utility to print listings in different formats. Similar to the Unix "pr" program. Includes source. Author: Samuel Paolucci
PushOver	A neat little board strategy game, in AmigaBASIC. Push your pieces onto the board until you get five in a row in any direction. Includes source. Author: R.Yost
PuzzlePro	Create a puzzle from an IFF picture, which the user can then piece back together again. Written in AmigaBASIC. Version 1.0, binary only, shareware, source available from author. Author: Syd Bolton

Fred Fish Disk 123

Arp	ARP stands for "AmigaDOS Replacement Project". Arp is an effort led by Charlie Heath of Microsmiths Inc., to replace the current DOS in a compatible fashion, so that current programs will continue to work. Arp also makes whatever improvements are possible, so that current and future programs will work better. Author: Various authors contributed work
Car	This animation is one of Allen's entries to the Badge Killer Demo Contest. It apparently is an inside joke relating to a well known Amigan's experience with a certain highend graphics hardware manufacturer. Author: Allen Hastings

Fred Fish Disk 124

Icons	Some sample animated icons. You might find just the icon for that refugee CLI program you've been meaning to make runable from the WorkBench environment. Author: L. Pfost
Tarot	An AmigaBASIC program written by the author as an exercise for learning BASIC. Contains some nice graphic renditions of tarot cards. Author: L.Pfost

Fred Fish Disk 125

ElGato	This animation is Kevin's entry to the Badge Killer Demo Contest. It also has a background music arrangement, requires Sonix to use. By Kevin Sullivans

Fred Fish Disk 126

Colour	A program to manipulate the colors of specific named screens, saving their current color sets to data files, loading new color sets from data files, or interactively changing the colors. Includes source. By J. Russell
Dance	These two programs, "dancing polygons", are John's entry to the Badge Killer Demo Contest. They are variations of one another, but demonstrate the range of colors available on the Amiga. Includes source. Author: John Olsen
HBHill	This animation is one of Kevin's entries to the Badge Killer Demo Contest. It is the first known animation that makes use of the Amiga's "Extra Half Brite" mode. Author: Kevin Sullivan
Iconify	A subroutine that creates an icon on the Amiga screen that can be subsequently dragged around, and double-clicked on. You can use this to have your programs "iconify" themselves to temporarily get out of the user's way. With source and demo program. By Leo Schwab
OnlyAmiga	This animation is Iqbal's entry to the Badge Killer Demo Contest. It consists of tree balls being juggled by pyramids rotating on their tops. By Iqbal Singh Hans
Suplib	The support library needed to rebuild various programs of Matt's from the source, including DME, DTERM, etc. Includes source. Author: Matt Dillon
VCheck	Version 1.2 of the virus detection program from Commodore Amiga Technical Support. This version will test for the presence of a virus in memory, or on specific disks. Binary only. Author: Bill Koester.

Fred Fish Disk 127

Bounce	This program is Steve and Tom's entry for the Badge Killer Demo Contest. It creates little dots that bounce around and multiply. Includes source. Author: Steve Hansel and Tom Hansel
Nemesis	This demo is Mark's entry to the Badge Killer Demo Contest. It is quite small for what it does, and won fifth place in the contest. Binary only. By Mark Riley
Ripples	This animation is one of Allen Hastings' entries to the Badge Killer Demo Contest. Unlike most other animations, it shows a fixed object from a moving point of view, rather than a moving object from a fixed point of view. Author: Allen Hastings

Fred Fish Disk 128

Dis	A 68000 disassembler, written in 68000 assembler. Includes source. Author: Greg Lee
DropCloth	lets you place a pattern, a 2 bitplane IFF image or a combination of a pattern and image, into the WorkBench backdrop. Version 2.2, shareware, binary only. Author: Eric Lavitsky
LedClock	An extremely simple clock program, for interlaced screens only. Includes source. Author: Ali Ozer
MRBackUp	A hard disk backup utility, that does a file by file copy to standard AmigaDOS floppy disks. Includes an intuition interface and file compression. Version 1.3, includes source. Author: Mark Rinfret
Paint	A simple screen painting program, written in web. Requires web preprocessing program to rebuild from source. Includes source in web. Author: Greg Lee
PrtDriver	A printer driver for the Toshiba "3 in one" printer in its Qume (best) mode. Includes source in C and assembler. Author: Rico Mariani
SDBackUp	A hard disk backup utility. CLI interface only. Does file compression. Version 1.1, binary only. By Steve Drew
Sed	A clone of the Unix sed (Stream EDitor) program. Includes source. Author: Eric Raymondw
Keys	A "hot-keys" program that binds keyboard function keys to window manipulation functions (window activation, front to back, moving screens, etc). Includes source. Author: Davide Cervone

Fred Fish Disk 129

DosKwik	A pair of programs which allow you to save files, or a group of files, to one or more floppies for quick loading, does not store files in DOS format, which is why it is faster. V2.0, update to FF103. Binary, Shareware. Author: Gary Kemper
MRBackUp	A hard disk backup utility, does a file by file copy to standard AmigaDOS floppy disks. Includes intuition interface & file compression. Versions 2.0 (with sources) and 2.1 (binary only, source available from author). Update of FF128. By Mark Rinfret
PaintJet	HP PaintJet printer driver from HP sources.
Patch	Two independent ports of Unix utility "patch", which applies context diffs to text file to automatically update them. Patch version 1.3 was ported to the Amiga by Rick Coupland and patch version 2.0 was ported by Johan Widen. Includes source. Author: Larry Wall

Fred Fish Disk 130

DirMaster	Shareware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters
Evo	Human evolution toy/tutorial with source.By S. Bonner
Hp	A nice RPN calculator prog, supports calculations with binary, octal, decimal, hex, float, and complex numbers. Other features include 32 registers for storing data and transcendental functions. V1.0, includes source. Author: Steve Bonner

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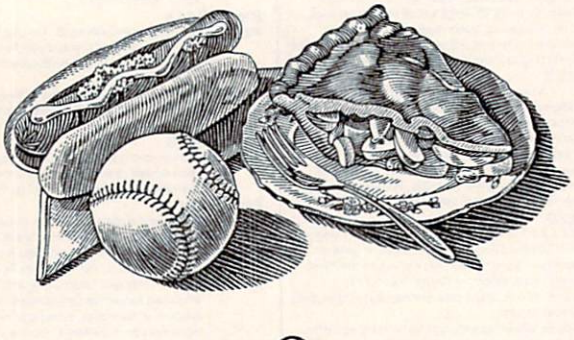

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Mach	"mouse accelerator" prog. also includes hotkeys, features of sun mouse, clicktofront, and popcli, a title bar clock with a bbs online charge accumulator, and more. V1.6a, includes source. Author: Brian Moats
PatEdit	A pattern editor for creating patterns to input to the Amiga SetAfPt macro call. This call sets the area fill pattern for the area filling graphics (RectFill, AreaDraw, etc). Includes source. By Don Hyde
CMan	Mandelbrot generator written partially in assem. for speed. Includes source. By Steve Bonner

Fred Fish Disk 131

Dfc	Copies disks like Maurader, but multitasks. Replaces both diskcopy and format but is smaller than either. It even has a nice little Intuition interface. Includes source. Author: Tomas Rokicki
HyperBase	Shareware database management system. V1.6, binary only, source available from authors. Update of FF58. By: Michael MacKenzie, Marc Mengel, & Craig Norborg
Life	A new version of Tomas's ancient Life game, but with a new macro language for setting up patterns, some good examples, and some more good stuff. Includes source Author: Tomas Rokicki
Mackie	A Popcli replacement that draws pretty lines on the screen in blanking mode. Includes source. Author: Software Distillery; enhancements by Tomas Rokicki
Mg1b	A version of Mg1b with an ARexx port and other improvements by Tomas Rokicki. Now define macros and bind them to function keys in your startup file. Includes source. Author: Various; enhancements by Tomas Rokicki
WFrags	Another version of Frags, this pops up a little window that updates occasionally. Necessary for developers who wonder what their program is doing to memory. Includes source. Author: Tomas Rokicki

Fred Fish Disk 132

Berserk	Animation, a "must see" for every Amiga user, and ranks with "Juggler" as a premier demo for the Amiga. The difference between this distribution, and FF100, is that this one includes "source". I.E. It contains all the object descriptions necessary to recreate the animation, Modify it, or use it as an example for creating your own animations. Fred Fish felt it was appropriate to have at least one animation that was available at the "source code" level. Author: Leo Schwab

Fred Fish Disk 133

Conman	Extremely useful Shareware replacement for the standard console handler, provides line editing and command line histories completely transparent to any application program that uses CON: windows. Version 1.1, binary only, updateof FF100. New features include additional editing keys, fast search keys, undo key, clear history command, and more. Author: William Hawes
Crc	Two programs useful for generating 16-bit CRC listings of the contents of disks, and verifying that a given disk's files still compute to the same CRC's as listed. V1.0, binary only. Author: Don Kindred
CrcLists	Complete CRC check files for disks 1-128 of the library, using the Crc program also included on this disk. These were made directly from Fred's master disks. Author: Fred Fish
Overscan	Patches the Intuition library so that sizable windows with MaxHeight of 200 (400 in interlace) and screens with Height of 200 (400 in interlace) will take advantage of the PAL overscan capability of Intuition V1.2. This seems to be useful only for European users that wish to run software written for the American market, without modifying the applications, but still using the additional space. Includes source. Author: Ari Freund

Fred Fish Disk 134

BoingThrows	50 frame HAM animation done with Sculpt-3D, and DigiPaint. The animation took about 325 hours of runtime to generate. By Marvin Landis
Browser	A workbench tool, using text-only windows, that makes all files in the system accessible for executing, copying, moving, renaming, deleting, etc. Billed as a "programmers workbench". Version 1.2, binary only. Author: Peter da Silva
Dme	V1.29 of Matt's text editor. Simple WYSIWYG editor designed for programmers. Not a WYSIWYG word processor in the traditional sense. Features include arbitrary key mapping, fast scrolling, title-line statistics multiple windows, and ability to iconify windows. Update of FF113, includes source. By Matt Dillon
Find	Utility searches for files that satisfy a given boolean expression of attributes, starting from a root pathname and searching recursively down through the hierarchy of the file system. Very much like the Unix find program. V1.0, includes source. By Rodney Lewis
Library	Demo version of a shareware program that stores textual information without regard to structure or content, and allows complicated searching for specific patterns. Written in assembler for speed, binary only. Author: Bill Brownson
SmartIcon	Shareware Intuition objects iconifier. V1.0 is limited to iconifying windows, adds a new "iconify gadget" to each window, that when clicked, iconifies the window into an icon in the ram: disk. Binary only, source available from author. Author: Gauthier Groult

Fred Fish Disk 135

TeXF	A selection of 78 TeX fonts, with a conversion program to convert them to Amiga fonts. 22 different fonts at various sizes, ranging from 15 pixels high to more than 150 pixels. The conversion program can also be used with the fonts distributed with AmigaTeX, yielding an additional 1000 or so more fonts for use with other Amiga programs. V2.5, binary only. By: Ali Ozer

Fred Fish Disk 136

AsmToolBox	Assembler "toolbox" created to make interfacing between assembler programs and AmigaDOS easy. With source. By Warren Ring
Bison	A replacement for unix "yacc" command. From the GNU (GNU is Not Unix) effort. It is a port of the latest GNU version, done by William Loftus, with the goal of preserving all of bison's current features. Includes source and testing program "calc". Author: Bob Corbett and Richard Stallman.
Iff2Pcs	Interactive puzzle program takes any IFF file containing up to 16 colors, and breaks it up into squares to make a puzzle which the user can then piece back together again. V1.1, update of FF122, includes source. Author: Ali Ozer
Paste	Version of the Unix paste utility. Paste concatenates corresponding lines of the specified files into a single output line (horizontal or parallel merging) or concatenates them into alternate lines (vertical or serial merging). Includes source. Author: David Ihnat
YaBoingII	A game program demonstrating hardware sprite usage, including collision detection. Update of FF36. Includes source. Author: Ali Ozer, based on original by Leo Schwab
Zoo	File archiver, much like "arc" in concept, but different in implementation and user interface details. Includes some nice features that "arc" lacks (such as file/path names up to 255 characters in length). This is version 1.71, update of FF108. Binary only. Author: Rahul Dhesi, Amiga port by Brian Waters

Fred Fish Disk 137

Ct	Program to display images from a CT scanner, along with several interesting sample images of scans of real people, including a skull, brain, heart, and spine. Each image is 256 by 256 pixels in 2048 gray scale. The display software, though it has a primitive user interface, is quite powerful, including functions like convolutions, averaging, laplacians, unsharp masking, edge detection, gradients, etc. Binary only. Author: Jonathan Harman
JeansIcons	Miscellaneous cute icons created for AMUC's monthly newsletter disk. Submitted by Stephen Vermeulen. Author: Steve Jeans
Muncho	A cute little program which plays a digitized sound sample when you insert or remove a disk from your drive. If you don't like the sounds, you can replace them with your own. Binary only. By: Andrew Werth
Sit	Update to the Set Icon Type prog. on FF107. V1.10, includes source. Author: Stephen Vermeulen
VGad	A new gadget editor that takes two pictures of the window and its gadgets, one being the normal gadget state and the other being the fully selected state, then merges the data and converts to C source code. V1.0, binary only. Author: Stephen Vermeulen
VirusX	A boot sector virus check program that runs in the background and automatically checks all inserted disks for a nonstandard boot sector. Such disks can optionally have their boot sector rewritten to remove the virus. Includes source. Author: Steve Tibbett
VLabel	Program to print fancy customized disk labels. It will combine an IFF picture and up to 50 lines of text (which may be placed arbitrarily in any font or point size) then print the result. The IFF picture can be virtually any size (up to 1008 by 1000). It will also print labels from a batch file produced by SuperBase. V1.20, binary only. Author: Stephen Vermeulen

Fred Fish Disk 138

AmigaLine	A series of various technical notes for Amiga programmers. Author: Byrce Nesbitt
Diff	Program that uses the same algorithm as the Unix diff program and also produces context diffs, suitable for use with patch. Binary only. Author: Unknown (Decus C diff?)
Foreach	A simple but useful program that expands a wild card file specification and then invokes the specified command once per expanded filename, with the expanded filename as the command argument. Includes source. Author: Jonas Flygare
MacFont	A conversion tool to convert Mac fonts to Amiga fonts. Binary only. Author: John O'Neill and Rico Mariani
ModulaTools	Various useful routines for those programming in Modula on the Amiga. Update to version on disk 94, includes source. Author: Jerry Mack
Vt100	Two new versions of Dave's vt100 terminal emulator. One version, based on vt100 2.6, has been enhanced by John Barshinger to include an iconify feature, add full 132 column support using overscan, and other miscellaneous features (binary only). The second version is release 2.8 of the mainstream version of vt100, as enhanced and supported by Tony Sumrall. This one includes source. Author: Dave Wecker

To Be Continued.....

In Conclusion

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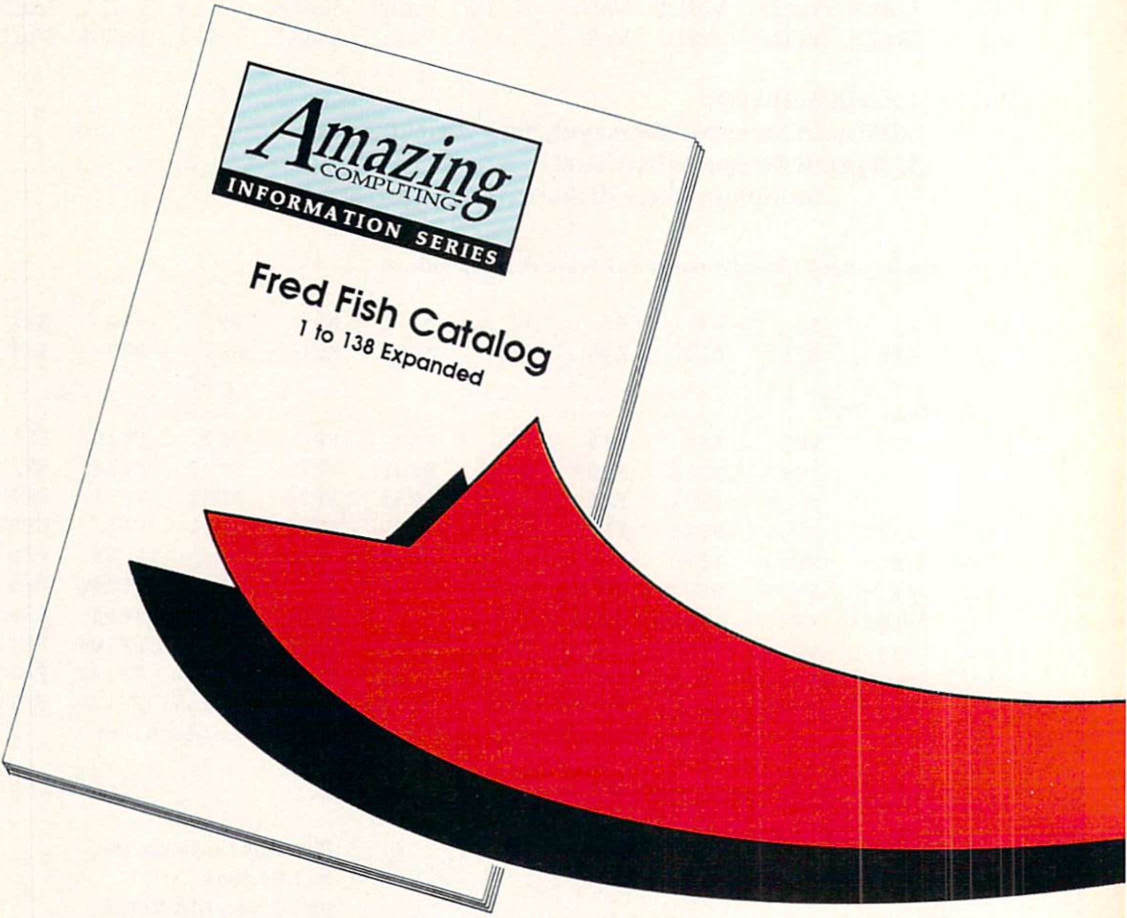

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Lynn's Luna C	50	TRU-IMAGE	70
Magnetic Images	54	West Coast Telecom	97

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